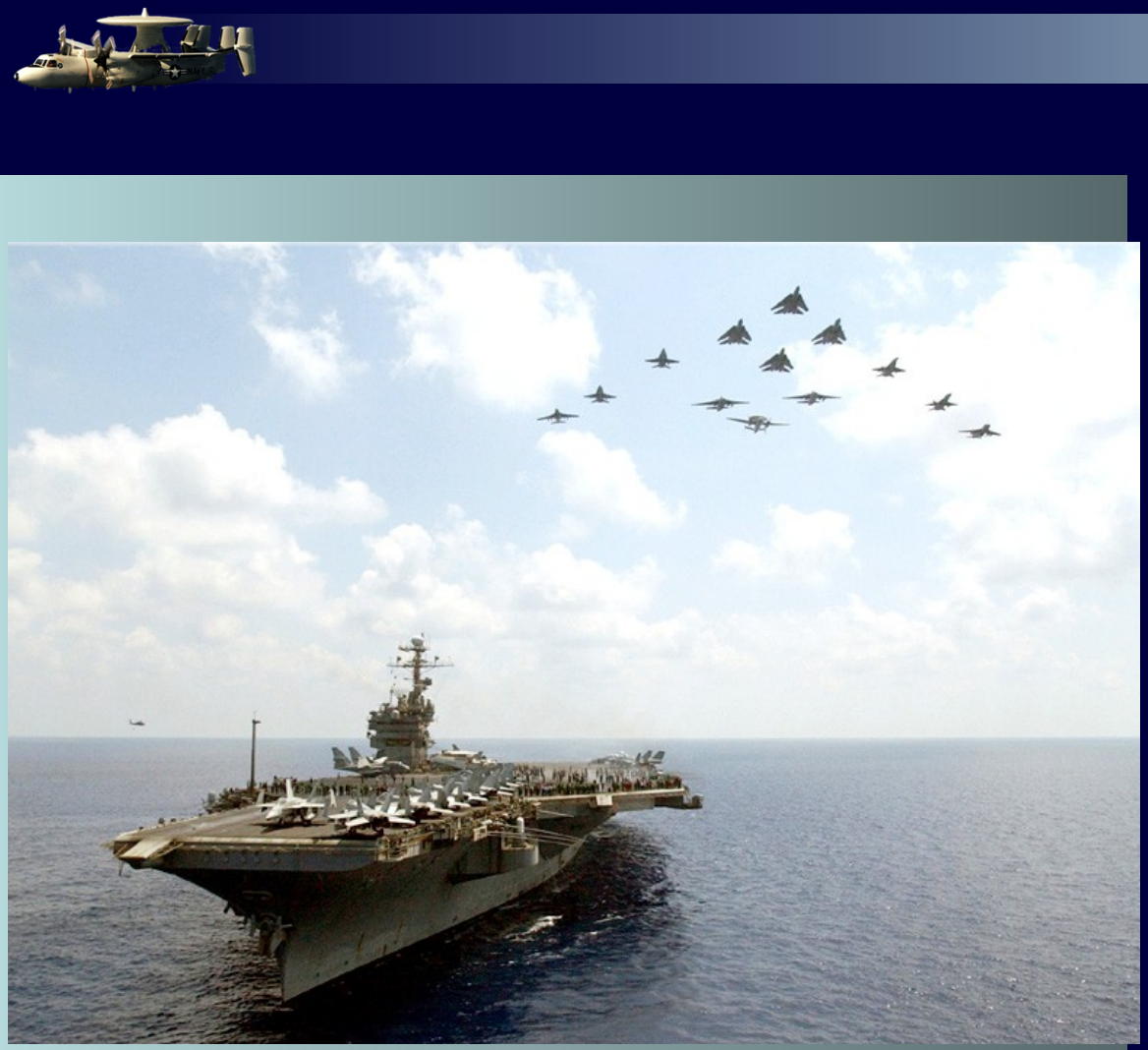
Instrument Ground School



Please sign Pilot or NFO Check-in Sheet

Instrument Ground School

References

- NATOPS General Flight & Operating Inst.
  - OPNAVINST 3710.7U
- NATOPS INST Flight Manual
  - NAVAIR 00-80T-112
- 2016 FAR/AIM

Course Overview

- Instrument Ground School Lecture
  - Instrument Ratings
  - Definitions
  - Aeromedical
  - Preflight Considerations
  - Takeoff and Departure
  - En Route Procedures
  - Arrival and Approach Procedures
  - Lost Communications
  - Airspace Review
  - Weather
- Exams

Rating Requirements

- Renewal:
  - Annually, within 60 days preceding the expiration of curren evaluation
  - Written examinatior and check flight must be within 60 days of each other.
- Expiration:
  - Annually, on last day of the month of the evaluation

Standard Rating Requirements

- 50 hours instrument pilot time under actual or simulated conditions
- Successfully complete an instrument evaluation in accordance with the NATOPS IFM
- TYCOM approved Instrument Ground School

Actual vs. Simulated Time

- Actual IMC
  - No external visual reference to horizon
  - Logged by both pilots
- Simulated IMC
  - Conditions external are VMC
  - Pilot at controls logs time

Actual vs. Simulated Approach

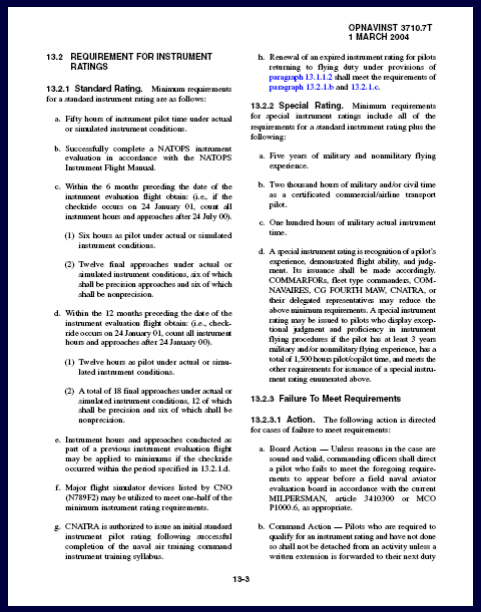
- Simulated Instrument Approach
  - -Approach flown in VMC conditions
- Actual Instrument Approach
  - -Approach flown in actual instrument conditions below 1000' AGL

Standard Rating Requirements

- Within last 6 months to the day of the flight:
  - Instrument Time
    - 6 hours actual or simulated
  - 12 approaches
    - 6 precision
    - 6 non-precision
- Within last 12 months to the day of the flight:
  - Instrument Time:
    - 12 hours actual or simulated
  - Approaches:
    - 12 precision
    - 6 non-precision

Standard Rating Requirements

- Check Flight:
  - Cannot count approaches towards minimums
  - Can count previous check flight if it occurred within the year time frame
- Simulator Usage:
  - Up to 1/2 of time and approach requirements
  - Approved simulators in OPNAVINST 3710.7U, Appendix K



OPNAVINST 3710.7T
1 MARCH 2004

13.2 REQUIREMENT FOR INSTRUMENT RATINGS

13.2.1 Standard Rating. Minimum requirements for a standard instrument rating are as follows:

a. Fifty hours of instrument pilot time under actual or simulated instrument conditions.

b. Successfully complete a NATOPS instrument evaluation in accordance with the NATOPS Instrument Flight Manual.

c. Within the 6 months preceding the date of the instrument evaluation flight obtain: (i.e., if the checkride occurs on 24 January 01, count all instrument hours and approaches after 24 July 00).

(1) Six hours as pilot under actual or simulated instrument conditions.

(2) Twelve final approaches under actual or simulated instrument conditions, six of which shall be precision approaches and six of which shall be nonprecision.

d. Within the 12 months preceding the date of the instrument evaluation flight obtain: (i.e., checkride occurs on 24 January 01, count all instrument hours and approaches after 24 January 00).

(1) Twelve hours as pilot under actual or simulated instrument conditions.

(2) A total of 18 final approaches under actual or simulated instrument conditions, 12 of which shall be precision and six of which shall be nonprecision.

e. Instrument hours and approaches conducted as part of a previous instrument evaluation flight may be applied to minimums if the checkride occurred within the period specified in 13.2.1.d.

f. Major flight simulator devices listed by CNO (N789F2) may be utilized to meet one-half of the minimum instrument rating requirements.

g. CNATRA is authorized to issue an initial standard instrument pilot rating following successful completion of the naval air training command instrument training syllabus.

h. Renewal of an expired instrument rating for pilots returning to flying duty under provisions of paragraph 13.1.1.2 shall meet the requirements of paragraph 13.2.1.b and 13.2.1.c.

13.2.2 Special Rating. Minimum requirements for special instrument ratings include all of the requirements for a standard instrument rating plus the following:

a. Five years of military and nonmilitary flying experience.

b. Two thousand hours of military and/or civil time as a certificated commercial/airline transport pilot.

c. One hundred hours of military actual instrument time.

d. A special instrument rating is recognition of a pilot's experience, demonstrated flight ability, and judgment. Its issuance shall be made accordingly. COMMARFORs, fleet type commanders, COMNAVAIRES, CG FOURTH MAW, CNATRA, or their delegated representatives may reduce the above minimum requirements. A special instrument rating may be issued to pilots who display exceptional judgment and proficiency in instrument flying procedures if the pilot has at least 3 years military and/or nonmilitary flying experience, has a total of 1,500 hours pilot/copilot time, and meets the other requirements for issuance of a special instrument rating enumerated above.

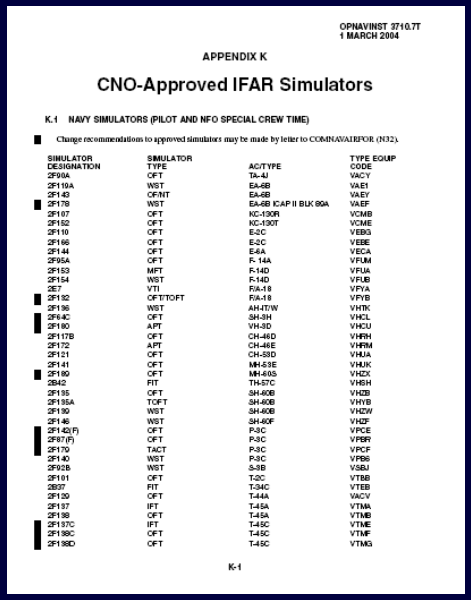
13.2.3 Failure To Meet Requirements

13.2.3.1 Action. The following action is directed for cases of failure to meet requirements:

a. Board Action — Unless reasons in the case are sound and valid, commanding officers shall direct a pilot who fails to meet the foregoing requirements to appear before a field naval aviator evaluation board in accordance with the current MILPERSMAN, article 3410300 or MCO P1000.6, as appropriate.

b. Command Action — Pilots who are required to qualify for an instrument rating and have not done so shall not be detached from an activity unless a written extension is forwarded to their next duty

13-3



OPNAVINST 3710.7T
1 MARCH 2004

APPENDIX K

CNO-Approved IFAR Simulators

K.1 NAVY SIMULATORS (PILOT AND NFO SPECIAL CREW TIME)

- Change recommendations to approved simulators may be made by letter to COMNAVAIRFOR (N32).

SIMULATOR DESIGNATION	SIMULATOR TYPE	AC/TYPE	TYPE EQUIP CODE
2F90A	OFT	TA-4J	VACY
2F119A	WST	EA-6B	VAEI
2F143	OF/NT	EA-6B	VAEY
2F179	WST	EA-6B ICAP II BLK 89A	VAEF
2F107	OFT	KC-130R	VCMB
2F152	OFT	KC-130T	VCME
2F110	OFT	E-2C	VEBG
2F166	OFT	E-2C	VEBE
2F144	OFT	E-6A	VECA
2F95A	OFT	F-14A	VFUM
2F153	MFT	F-14D	VFUA
2F154	WST	F-14D	VFUB
2E7	VTI	F/A-18	VFYA
2F132	OFT/TOFT	F/A-18	VFYB
2F196	WST	AH-1T/W	VHTK
2F64C	OFT	SH-3H	VHCL
2F180	APT	VH-3D	VHCU
2F117B	OFT	CH-46D	VHRH
2F172	APT	CH-46E	VHRM
2F121	OFT	CH-53D	VHUA
2F141	OFT	MH-53E	VHUK
2F189	OFT	MH-60S	VHZX
2B42	FIT	TH-57C	VHSH
2F195	OFT	SH-60B	VHZB
2F195A	TOFT	SH-60B	VHYB
2F190	WST	SH-60B	VHZW
2F146	WST	SH-60F	VHZF
2F142(F)	OFT	P-3C	VPCE
2F97(F)	OFT	P-3C	VPBR
2F170	TACT	P-3C	VPCF
2F140	WST	P-3C	VPB6
2F92B	WST	S-3B	VSBJ
2F101	OFT	T-2C	VTBB
2B37	FIT	T-34C	VTEB
2F189	OFT	T-44A	VACV
2F137	IFT	T-45A	VTMA
2F198	OFT	T-45A	VTMB
2F137C	IFT	T-45C	VTME
2F198C	OFT	T-45C	VTMF
2F198D	OFT	T-45C	VTMG

K-1

Special Instrument Rating Requirements

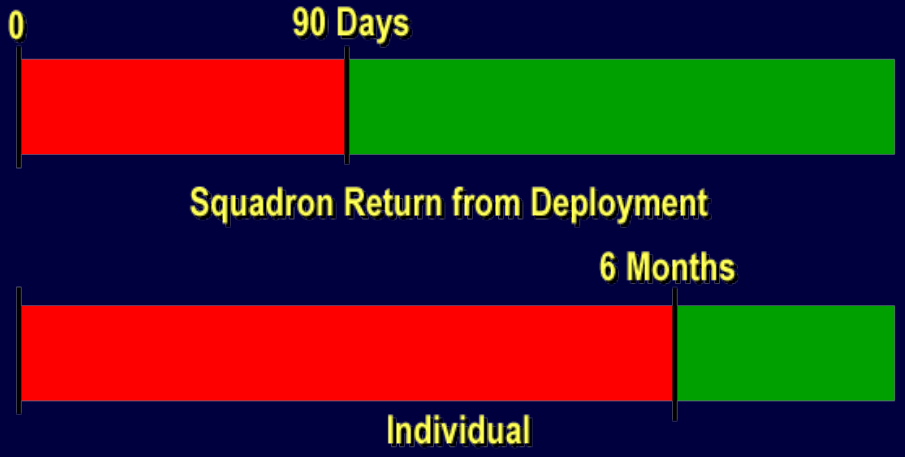
- Must meet all requirements for a Standard rating and…
- 5 years flying experience
  - Military or non-military flying
- 2,000 hours of flight time
  - Military
  - Commercial or Airline transport time
- 100 hours of military actual instrument time
- Demonstrated flight ability, experience, and judgment
- Can be waived to:
  - 3 Years and 1,500 hours at TYCOM discretion

Expired?

- Currently fulfilling DIFOPS orders
  - Automatic Fleet Naval Aviator Evaluation Board (FNAEB)…
  - At VAW-120 everyone’s paperwork must be routed and signed in the same month as the flight is flown (Pilots) or IGS is conducted (NFOs)
- Active duty pilots/NFOs who are returning from duty where a valid rating could not be maintained:
  - 6-month requirements
    - 6 Hours Instrument Time
    - 6 Precision Approaches
    - 6 Non-precision
  - IGS
  - INSTX

Extensions

- CO may grant 90 day extension following deployment
- Issuing authority may approve written request for a 6 month extension due to circumstances beyond control of the individual (hospitalization, TAD, etc.)



Aero-medical Topics

- Drugs, alcohol, etc.
- Restrictive activities
- Blood donation
- Anti-exposure suits
- Spatial Disorientation
- Personal Electronic Devices

Chap 8

Naval Aviation Survival Training Progam

- Renew NASTP qualification every 4 years

- Qualifications of personnel who do not fly for 18 consecutive months are considered expired.

- Shall complete training prior to deployment if qualifications will expire during deployment or within 60 days of deployment completion.

Drugs and Alcohol

- Self-medication
  - Prohibited unless approved by your flight surgeon
- Alcohol
  - Aircrew must abstain 12 hours prior to pre-flight planning
  - Free of hangover effects prior to flight

Chap 8

Tobacco and Caffeine

- Tobacco
  - Nicotine can impair oxygen absorption
  - Prohibited in Naval Aircraft

- Caffeine
  - Dehydration
  - Recommended maximum intake of 450 mg per day (3-4 cups of coffee)

Restrictive Activities

- SCUBA
  - Prohibited from flying for 24 hours, but may be waived to 12 hours by a Flight Surgeon in urgent circumstances
- HEED/HABD
  - Prohibited from flying for 12 hours.
- Immunizations
  - Shall not fly for 12 hours unless cleared by flight surgeon (flu mist -> 72hrs)

More Restrictive Activities

- Dental:
  - When drugs (i.e., Novocain) administered, shall be grounded for 12 hours
- Simulator:
  - Should consult flight surgeon before participating in flying duties if experiencing simulator sickness

Blood Donation

- Aircrew shall not
  - be regular donors... minimum 4 months
  - donate within four weeks of combat or shipboard flying
  - participate in flying duties or low-pressure chamber within four days donating

Anti-exposure Suits

- Shall be provided when…
  - Water 50°F or below
  - Outside air temperature is 32°F (corrected for wind chill) or below.
  - Water temperature is between 50°F and 60°F and CO determines they are necessary.
- Air temperature below 50°F and anti-exposure suits not required, 3710 recommends the use of aramid (fire retardant) undergarments.

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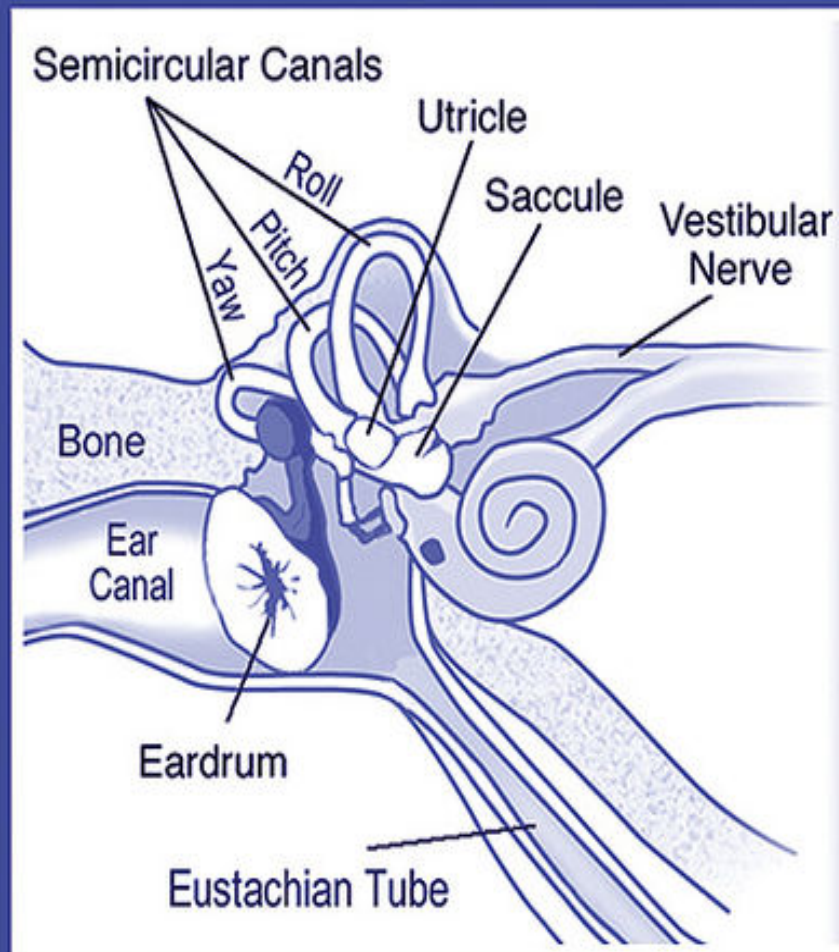
NOVEMBER 23, 2009

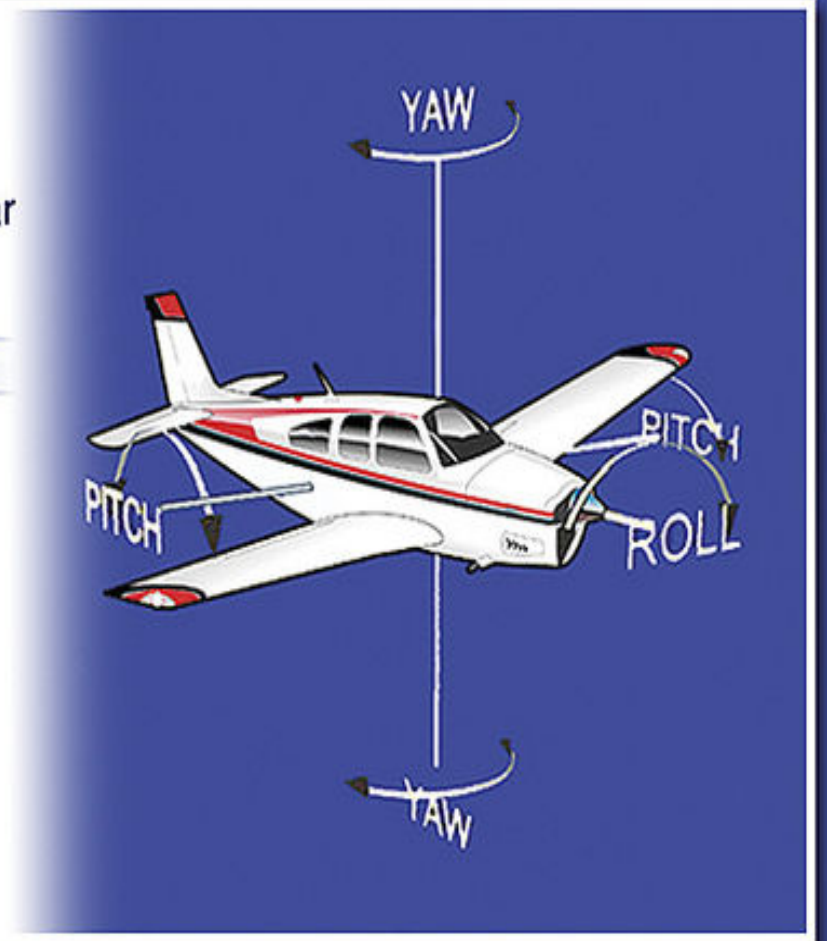
(a) Assess maximum probable rescue time (which is a function of mission distance, SAR equipment, and SAR location).

(b) Determine the lowest water temperature in the mission area during the time period of flight.

(4) When OAT corrected for wind chill is at or below 50°F and anti-exposure suits are not mandated the wearing of fire-resistant (aramid) undergarments is recommended. Wearing double layers of these undergarments can significantly improve anti-exposure performance in a cold dry environment (e.g., survival situation resulting from overland mountainous flight profile).

Spatial Disorientation





Spatial Disorientation

- Categories of Spatial Disorientation
  - Type I – Unrecognized
    - Primary type of disorientation in Naval Aviation mishaps.
  - Type II – Recognized
    - Trust your instruments
  - Type III – Incapacitating
    - You may be aware but are physically unable to correct.

Spatial D Prevention

- Don’t fly by seat of the pants
- Early instrument transition
- Proficiency
- Unnecessary maneuvers
- Condition awareness
- Transfer Positive Control of Aircraft
- Experience

Personal Electronic Devices

"Cellular telephones shall not be operated by naval aircraft once airborne."

-OPNAV3710

- COMACCLOGWING is currently testing iPADs with select squadrons. Any other non-sanctioned use is not authorized.

Preflight Considerations

Aircrew Definitions

- Single Piloted
  - One set of flight controls or a tandem cockpit
  - Two sets of flight controls and instruments, but only one NATOPS qualified Pilot.

Aircrew Definitions

- Multi-Piloted
  - Two Sets of Flight Controls and Instruments
  - Two NATOPS Qualified/Instrument Rated Pilots

Non-essential Flights

- “Flights that may be construed as fraud, waste, or abuse by the public”
- Routine business when more economical transportation exists
- Convenience or prestige of officers concerned and not official duties or bona fide training
- Major sporting events or civic celebrations
- Repeated flights to hometown

Chap 3

Authorized Airfields

- Military fields listed in DOD Flip En Route Supplement
- Joint civil-military airfields
- Civil Fields in IFR Enroute Supp

***Civilian airfields shall not be used for RON unless required for mission accomplishment. In such cases, approval by the appropriate wing/group commander is required. ***

Civil Airfields

- **As a stopover or RON, a civil airfield must meet one of the following:**
  - Contribute to mission
  - Add value to training
  - Best interest of the taxpayer
  - WX or emergency alternate

** No RON unless necessary for mission acomplishment

Authorized Fuel

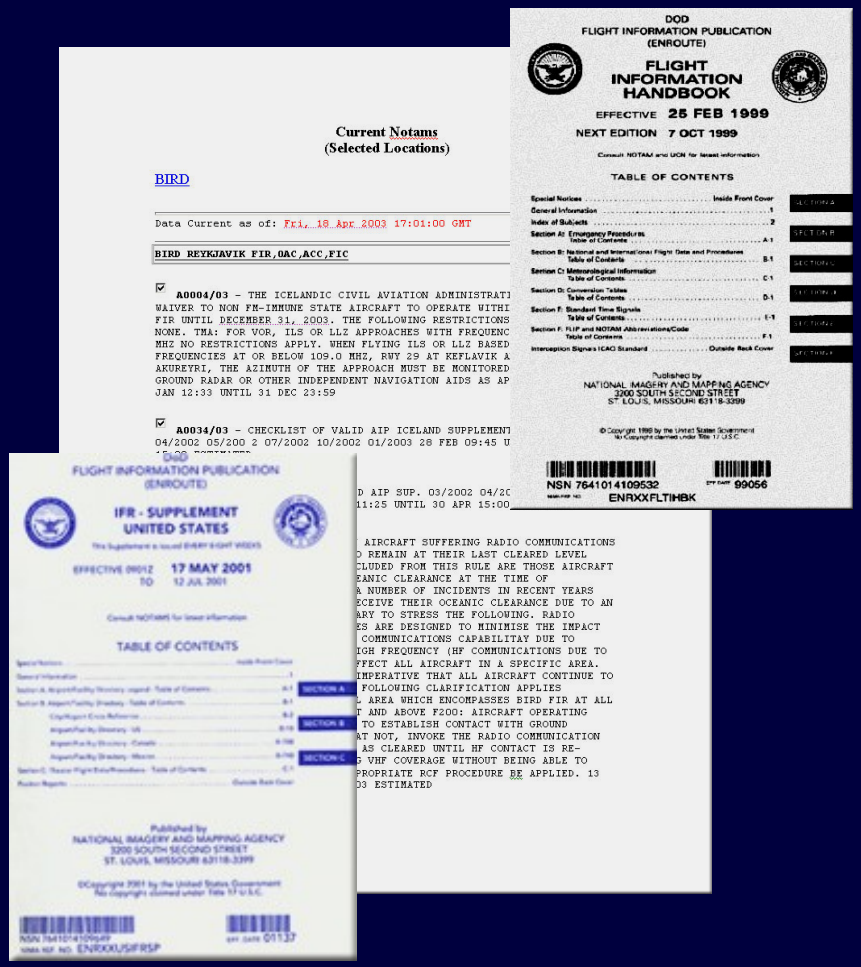
- Military/Contract Fuel
  - JP 4/5/8, JET-A
- Commercial and non-contract fuel
  - Official business
  - Emergency
  - Alternate airfield
  - Aircraft with limited range

Preflight Planning

- NOTAMS
- WX reports and forecasts
- Alternates
- Fuel requirements and planning
- FCF planning
- DD-175

Notices to Airmen

- Base OPS
  - Updated daily, hourly
    - Notams.jcs.mil
    - FAA.gov
    - Jeppesen
    - GPS NOTAMS available (KGPS)
- Times in Zulu
- FIH provides codes for translation.
- IFR Sup & AP/1 include long term NOTAMS


Current Notams
(Selected Locations)
BIRD
Data Current as of: Fri, 18 Apr 2003 17:01:00 GMT
BIRD REYKJAVIK FIR,OAC,ACC,FIC
A0004/03 - THE ICELANDIC CIVIL AVIATION ADMINISTRATI
WAIVER TO NON FM-IMMUNE STATE AIRCRAFT TO OPERATE WITHI
FIR UNTIL DECEMBER 31, 2003. THE FOLLOWING RESTRICTIONS
NONE. TMA: FOR VOR, ILS OR LLZ APPROACHES WITH FREQUENC
MHZ NO RESTRICTIONS APPLY. WHEN FLYING ILS OR LLZ BASED
FREQUENCIES AT OR BELOW 109.0 MHZ, RWY 29 AT KEFLAVIK A
AKUREYRI, THE AZIMUTH OF THE APPROACH MUST BE MONITORED
GROUND RADAR OR OTHER INDEPENDENT NAVIGATION AIDS AS AP
JAN 12:33 UNTIL 31 DEC 23:59
A0034/03 - CHECKLIST OF VALID AIP ICELAND SUPPLEMENT
04/2002 05/200 2 07/2002 10/2002 01/2003 28 FEB 09:45 U
D AIP SUP. 03/2002 04/2C
11:25 UNTIL 30 APR 15:00
AIRCRAFT SUFFERING RADIO COMMUNICATIONS
D REMAIN AT THEIR LAST CLEARED LEVEL
CLUDED FROM THIS RULE ARE THOSE AIRCRAFT
EANIC CLEARANCE AT THE TIME OF
A NUMBER OF INCIDENTS IN RECENT YEARS
ECEIVE THEIR OCEANIC CLEARANCE DUE TO AN
ARY TO STRESS THE FOLLOWING. RADIO
ES ARE DESIGNED TO MINIMISE THE IMPACT
COMMUNICATIONS CAPABILITAY DUE TO
IGH FREQUENCY (HF COMMUNICATIONS DUE TO
FFECT ALL AIRCRAFT IN A SPECIFIC AREA.
IMPERATIVE THAT ALL AIRCRAFT CONTINUE TO
FOLLOWING CLARIFICATION APPLIES
L AREA WHICH ENCOMPASSES BIRD FIR AT ALL
T AND ABOVE F200: AIRCRAFT OPERATING
TO ESTABLISH CONTACT WITH GROUND
AT NOT, INVOKE THE RADIO COMMUNICATION
AS CLEARED UNTIL HF CONTACT IS RE-
G VHF COVERAGE WITHOUT BEING ABLE TO
PROPRIATE RCF PROCEDURE BE APPLIED. 13
03 ESTIMATED
DOD
FLIGHT INFORMATION PUBLICATION
(ENROUTE)
FLIGHT INFORMATION HANDBOOK
EFFECTIVE 25 FEB 1999
NEXT EDITION 7 OCT 1999
TABLE OF CONTENTS
Published by
NATIONAL IMAGERY AND MAPPING AGENCY
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ST. LOUIS, MISSOURI 63118-3399
NSN 7641014109532
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(ENROUTE)
IFR - SUPPLEMENT
UNITED STATES
EFFECTIVE 0901Z 17 MAY 2001
TO 12 JUL 2001
TABLE OF CONTENTS
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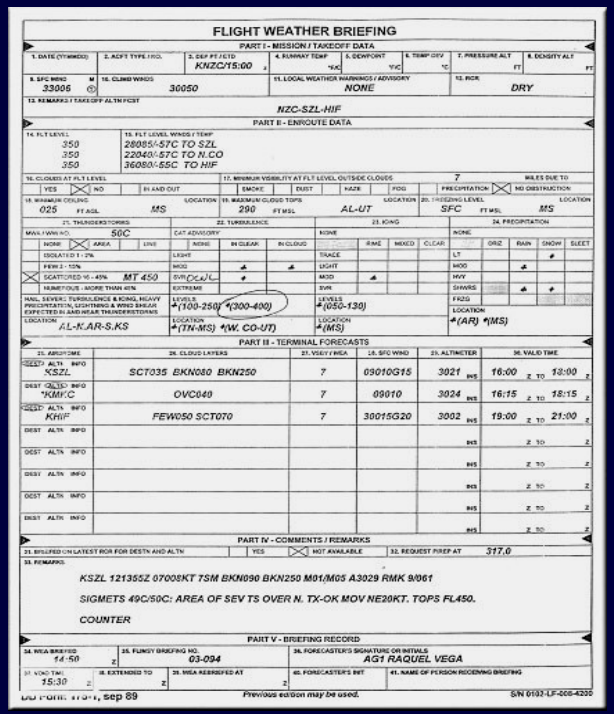
3200 SOUTH SECOND STREET
ST. LOUIS, MISSOURI 63118-3399
ENRXXUSIFRSP

DD-175-1

- Valid for 3 hours from delivery or ½ hour after ETD, whichever is earlier
- “When any portion of the intended route is forecast to be under IMC, naval aviators shall obtain a flight route weather brief from DoD qualified forecaster or approved forecasting service."
- “Naval aviators shall request a DD-175-1 flight route weather brief from a DoD qualified forecaster whenever a DD-175/DD-1801 flight plan is filed."



FLIGHT WEATHER BRIEFING

PART I - MISSION / TAKEOFF DATA

1. DATE (YY/MM/DD)	2. ACFT TYPE / NO.	3. DEP PT / ETD	4. RUNWAY TEMP °K/°C	5. DEWPOINT °K/°C	6. TEMP DEV °C	7. PRESSURE ALT FT	8. DENSITY ALT FT
		KNZC/15:00 Z					

9. SFC WIND M / T	10. CLIMB WINDS	11. LOCAL WEATHER WARNINGS / ADVISORY	12. RVR
33006	30050	NONE	DRY

13. REMARKS / TAKEOFF ALTN FCST: NZC-SZL-HIF

PART II - ENROUTE DATA

14. FLT LEVEL	15. FLT LEVEL WINDS / TEMP
350	26085/-57C TO SZL
350	22040/-57C TO N.CO
250	36080/-55C TO HIF

16. CLOUDS AT FLT LEVEL: YES / NO — IN AND OUT

17. MINIMUM VISIBILITY AT FLT LEVEL OUTSIDE CLOUDS: 7 MILES DUE TO: SMOKE / DUST / HAZE / FOG

PRECIPITATION / NO OBSTRUCTION

18. MINIMUM CEILING	LOCATION	19. MAXIMUM CLOUD TOPS	LOCATION	20. FREEZING LEVEL	LOCATION
025 FT AGL	MS	290 FT MSL	AL-UT	SFC FT MSL	MS

21. THUNDERSTORMS: MAX / MIN HO: 50C

22. TURBULENCE: CAT ADVISORY: NONE

23. ICING: NONE

24. PRECIPITATION: NONE

	NONE	AREA	LINE		NONE	IN CLEAR	IN CLOUD		RIME	MIXED	CLEAR		DRIZ	RAIN	SNOW	SLEET
ISOLATED I - 2%				LIGHT				TRACE				LT				
FEW 2 - 10%				MOD				LIGHT				MOD				
SCATTERED 16 - 45%			MT 450	SVR/CLNC				MOD				HVY				
NUMEROUS - MORE THAN 45%				EXTREME				SVR				SHWRS				

MISC. SEVER: TURBULENCE & ICING, HEAVY PRECIPITATION, LIGHTNING & WIND SHEAR EXPECTED IN AND NEAR THUNDERSTORMS

LOCATION: AL-K.AR-S.KS

LEVELS *(100-250) *(300-400)

LOCATION *(TN-MS) *(W. CO-UT)

LEVELS *(050-130)

LOCATION *(MS)

FRZG LOCATION *(AR) *(MS)

PART III - TERMINAL FORECASTS

25. AIRFIELD	26. CLOUD LAYERS	27. VSBY / WEA	28. SFC WIND	29. ALTIMETER	30. VALID TIME
DEST / ALTN / INFO: KSZL	SCT035 BKN080 BKN250	7	09010G15	3021 INS	16:00 Z TO 18:00 Z
DEST / ALTN / INFO: *KMKC	OVC040	7	09010	3024 INS	16:15 Z TO 18:15 Z
DEST / ALTN / INFO: KHIF	FEW050 SCT070	7	30015G20	3002 INS	19:00 Z TO 21:00 Z
DEST / ALTN / INFO				INS	Z TO Z
DEST / ALTN / INFO				INS	Z TO Z
DEST / ALTN / INFO				INS	Z TO Z
DEST / ALTN / INFO				INS	Z TO Z

PART IV - COMMENTS / REMARKS

31. BRIEFED ON LATEST INFO FOR DESTN AND ALTN: YES / NOT AVAILABLE

32. REQUEST PIREP AT: 317.0

33. REMARKS:

KSZL 121355Z 07008KT TSM BKN090 BKN250 M01/M05 A3029 RMK 9/061

SIGMETS 49C/50C: AREA OF SEV TS OVER N. TX-OK MOV NE20KT. TOPS FL450.

COUNTER

PART V - BRIEFING RECORD

34. WEA BRIEFED	35. FLWSY BRIEFING NO	36. FORECASTER'S SIGNATURE OR INITIALS
14:50 Z	03-094	AG1 RAQUEL VEGA

37. VOID TIME	38. EXTENDED TO	39. WEA REBRIEFED AT	40. FORECASTER'S INIT	41. NAME OF PERSON RECEIVING BRIEFING
15:30 Z	Z	Z		

DD FORM 175-1, SEP 89 — Previous edition may be used. — S/N 0102-LF-000-4200

Alternatives to FWB

- 1-888-PILOTWX
- Air Force Weather
- Marine Corps Services
- Commercial forecaster with COMNAVAIR approval

Alternate Selection

DESTINATION WEATHER ETA plus and minus 1 hour	ALTERNATE WEATHER ETA plus and minus 1 hour	
0 – 0 up to but not including Published minimums	3,000 – 3 or better	
Published minimums up to but not including 3,000 – 3 (single – piloted absolute minimums 200 – 1/2) (single – piloted helicopter/tilt – rotor absolute minimums 200 – 1/4)	NON-PRECISION	PRECISION
	*Published minimums plus 300 – 1	*Published minimums plus 200 – 1/2
3,000 – 3 or better	No alternate required	
*In the case of single – piloted or other aircraft with only one operable UHF/VHF transceiver, radar/airport surveillance approach (PAR/ASR) minimums may not be used as the basis for selection of an alternate airfield.		

Figure 4-1. IFR Filing Criteria

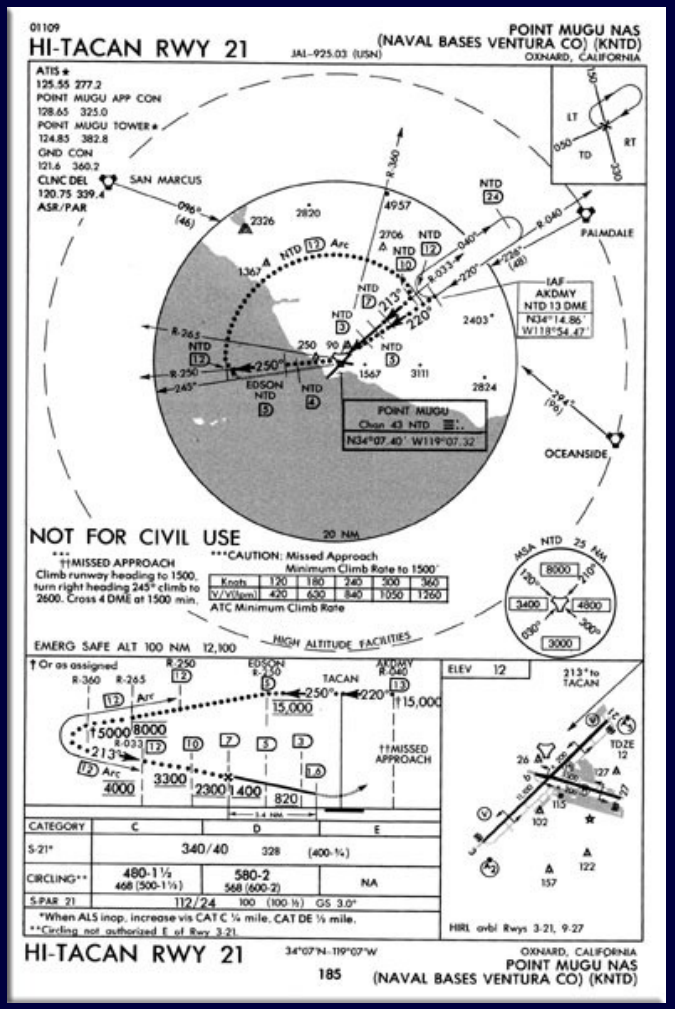
Alternate Selection

If destination lacks an approach that can be flown without a two-way radio

or…

WX at alternate is forecast below 3000-3 ETA ± 1 hour

- Then the alternate must have a published approach that can be flown with the installed navigation equipment and without a two-way radio


HI-TACAN RWY 21
POINT MUGU NAS (NAVAL BASES VENTURA CO) (KNTD)
OXNARD, CALIFORNIA
NOT FOR CIVIL USE
HI-TACAN RWY 21
OXNARD, CALIFORNIA
POINT MUGU NAS (NAVAL BASES VENTURA CO) (KNTD)

Weather Watch

- Issued by National Weather Service Storm Prediction Center
  - http://spc.noaa.gov
- No filing through a W.W. permitted unless:
  - Can fly over…OR
  - W.W. “Not progressing as forecast.”…***AND***
    - File VFR and Maintain VMC…
    - File IFR and Maintain VMC…
    - File IFR and have operable weather radar

Icing & Thunderstorms

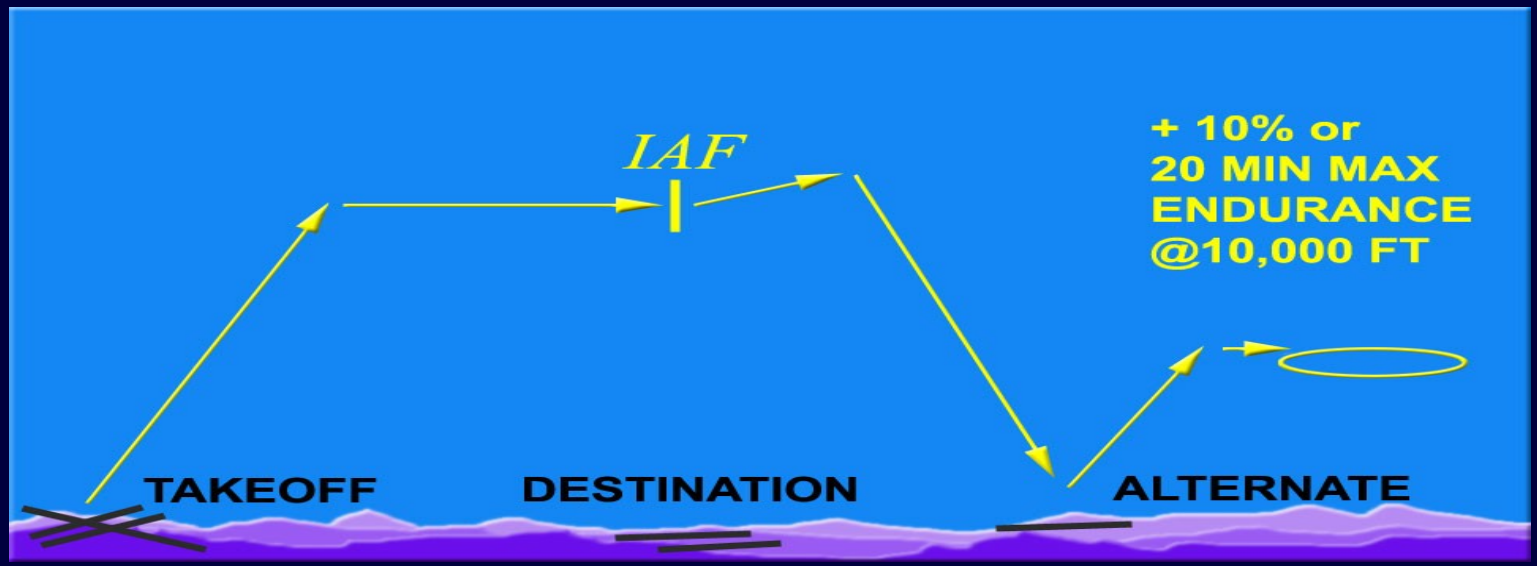
- “Flights shall be planned to circumvent areas of forecast atmospheric icing and thunderstorm conditions whenever practicable”

Alternate Fuel Planning

- If an alternate is not required:
  - Takeoff to destination PLUS reserve of 10% of planned fuel requirements
    - Reserve shall not be less than 20 minutes at maximum endurance at 10,000 ft

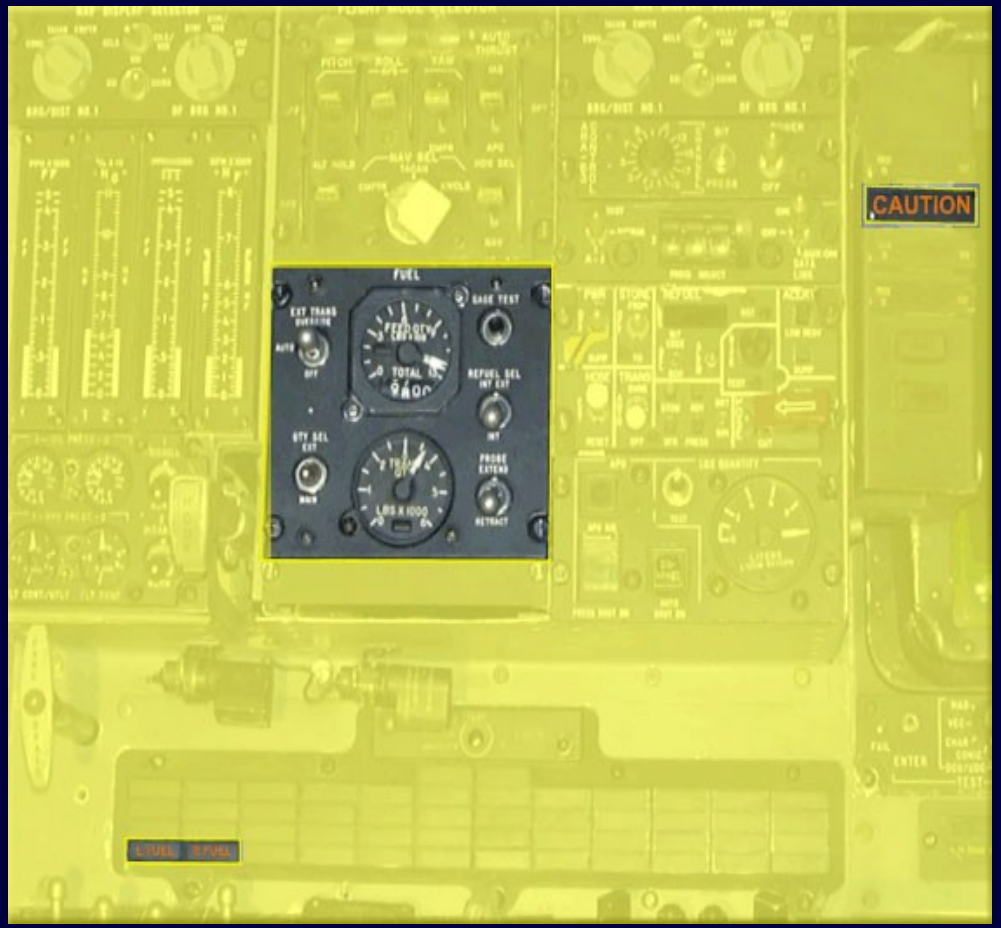
Alternate Fuel Planning

- If an alternate is required
  - Takeoff to the approach fix at destination then to an alternate, plus reserve of 10% of planned fuel requirements
    - Reserve shall not be less than 20 minutes at maximum endurance at 10,000 ft



Minimum and Emergency Fuel

- MINIMUM FUEL
  - Advisory in nature requesting no undue delays to destination
- EMERGENCY FUEL
  - Emergency declaration and requesting priority handling



Bingo Data

- E-2
  - Bingo allows for 780lbs of VFR maneuvering and 300lbs of gauging error (20 minutes at 5-10k feet). For **IFR**, pilot's judgment to add 400lbs per anticipated required approach.
- C-2
  - Bingo allows for 800lbs of VFR maneuvering and 300lbs of gauging error. For **IFR**, add 1000lbs.

GEAR UP **E-2BINGO DATA** **FLAPS UP**

SEPTEMBER 2011

ZERO FUEL GROSS WEIGHT = 42,600 POUNDS

SINGLE ENGINE
STANDARD ATMOSPHERE

ENGINES: (1)T56-A-427
95% EFFICIENCY

FUEL REQUIRED
(INCLUDES 1080 POUNDS RESERVE)[1]

CRUISE ALTITUDE[2]	SEA LEVEL			5,000 FT				10,000 FT				15,000 FT				
HEADWIND KNOTS	0	20	40	0	20	40	60	0	20	40	60	0	20	40	60	80
CRUISE SPEED - KIAS	175	181	188	172	177	182	188	167	171	176	182	163	167	172	175	180
DISTANCE NM	FUEL 1000 POUNDS			FUEL 1000 POUNDS				FUEL 1000 POUNDS				FUEL 1000 POUNDS				
10	1.2	1.2	1.2													
20	1.3	1.3	1.4		1.3	1.4	1.4									
40	1.5	1.5	1.6	1.5	1.5	1.6	1.6			1.6	1.7					
60	1.7	1.7	1.8	1.6	1.7	1.8	1.9	1.7	1.7	1.8	1.9				1.9	2.0
80	1.8	1.9	2.0	1.8	1.9	2.0	2.1	1.8	1.9	2.0	2.1	1.8	1.9	2.0	2.1	2.2
100	2.0	2.1	2.3	2.0	2.1	2.2	2.4	2.0	2.0	2.2	2.3	2.0	2.1	2.2	2.3	2.5
120	2.2	2.3	2.5	2.1	2.3	2.4	2.6	2.1	2.2	2.4	2.5	2.1	2.2	2.3	2.5	2.7
140	2.4	2.5	2.7	2.3	2.4	2.6	2.8	2.3	2.4	2.5	2.7	2.3	2.4	2.5	2.7	2.9
160	2.6	2.7	3.0	2.5	2.6	2.8	3.1	2.4	2.6	2.7	3.0	2.4	2.5	2.7	2.9	3.2
180	2.7	3.0	3.2	2.6	2.8	3.0	3.3	2.6	2.7	2.9	3.2	2.5	2.7	2.8	3.1	3.4
200	2.9	3.2	3.4	2.8	3.0	3.2	3.6	2.7	2.9	3.1	3.4	2.7	2.9	3.1	3.3	3.6
250	3.4	3.7	4.0	3.2	3.5	3.8	4.2	3.1	3.3	3.6	4.0	3.1	3.3	3.5	3.8	4.2
300	3.8	4.2	4.6	3.6	3.9	4.3	4.8	3.5	3.8	4.1	4.5	3.4	3.7	4.0	4.3	4.8
350	4.3	4.7	5.2	4.1	4.4	4.8	5.4	3.9	4.2	4.6	5.1	3.8	4.1	4.4	4.9	5.4
400	4.8	5.2	5.8	4.5	4.9	5.4	6.0	4.3	4.6	5.1	5.6	4.2	4.5	4.9	5.4	6.0
DESCENT DIST.[3,4]	-			9.7	8.7	7.6	6.6	19.6	17.6	15.5	13.5	29.7	26.7	23.7	20.7	17.7

NOTES:

1. AT ARRIVAL OVERHEAD, ALLOWS 780 POUNDS FOR A 20 MINUTE LOITER AT 5,000' TO 10,000' MSL PLUS 300 POUNDS GAUGING ERROR. FOR ADDITIONAL INSTRUMENT APPROACHES ADD 400 POUNDS. FOR ADDITIONAL VFR APPROACHES ADD 100 POUNDS.
2. CLIMB WITH NORMAL POWER TO CRUISE ALTITUDE FROM SEA LEVEL; CLIMB SCHEDULE IS 155 KIAS AT SEA LEVEL WITH A DECREASE OF 1 KIAS PER 1000 FEET OF ALTITUDE.
3. DESCEND AT FLIGHT IDLE; DESCENT AIRSPEED IS 178 KIAS.
4. DESCENT DISTANCES ARE FROM CRUISE ALTITUDE TO SEA LEVEL IN NAUTICAL MILES.
5. SHADED CELLS INDICATE CRUISE CEILING IS BELOW BINGO ALTITUDE; HOWEVER, AT TEMPERATURES LESS THAN 11°C BELOW STANDARD DAY, CRUISE CEILING FOR ALL SHADED CELLS WILL EXCEED BINGO ALTITUDE.

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FCF Requirements

- Minimum crew required for safe flight
- Daylight and VMC
- Critical portions of the flight shall be conducted in the vicinity of a suitable landing area
- 3710 directs that engine shutdowns for an FCF shall not be conducted below 4,000 ft AGL

DD-175

- General Planning, Ch. 4

AUTHORITY: 10 USC 8013 and EO 9397. PRINCIPAL PURPOSE: To aid in accurate identification of personnel participating in the Filer flight. PRIVACY ACT STATEMENT — ROUTINE USES: To provide data required to process flight plans with appropriate air traffic service authorities. A file is retained by the agency processing the flight plan. DISCLOSURE: Voluntary; however, failure to provide the SSN could result in delay of flight.

DATE	AIRCRAFT CALL SIGN	AIRCRAFT DESG AND TD CODE
29 JUN 01	VVAB70D	S3/P

BASE OPERATIONS USE

	TYPE FLT PLAN	TRUE AIRSPEED	POINT OF DEPARTURE	PROPOSED DEPARTURE TIME (Z)	ALTITUDE	ROUTE OF FLIGHT	TO	ETE
	I	360	NIP	1200	220	TAY J2 CEW	NPA	1+00
	I	360	NIP	1400	220	SJI J2 LCH J22 CRP	NGP	2+00
						(4+00 NQI 0+05)		

REMARKS: NGP - PPR 123456
NGP - S

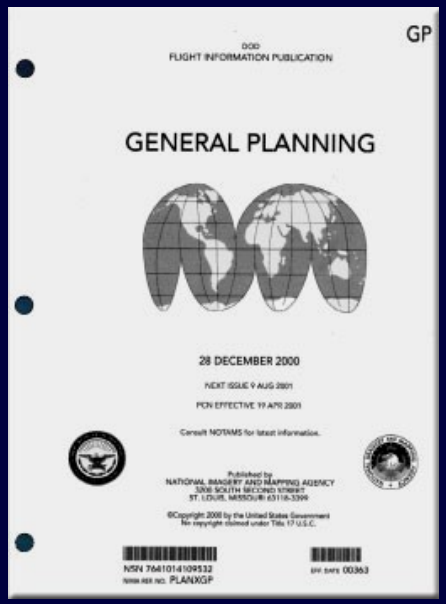
RANK AND HONOR CODE

FUEL ON BD	ALTN AIRFIELD	ETE TO ALTN	NOTAMS	WEATHER	WT AND BALANCE	AIRCRAFT SERIAL NUMBER, UNIT, AND HOME STATION
5+00	VPS	0+05	✔	LS-145	ON FILE	ON FILE, VS-32, NIP

SIGNATURE OF APPROVAL AUTHORITY: Thomas French — CREW/PASSENGER LIST: ATTACHED / ✔ SEE PSGR MANIFEST — ACTUAL DEP TIME (Z) — BASE OPERATIONS USE

DUTY	NAME AND INITIALS	RANK	SSN	ORGANIZATION AND LOCATION
PILOT IN COMMAND	BROWN, T	LT	ON FILE	VS-32, NIP
CP	SMITH, B	LT	ON FILE	VS-32, NIP

DD Form 175, MAY 86 (EG) — Previous editions are obsolete. — MILITARY FLIGHT PLAN



Use the SID filing format: NGU8.XXX transition

Course Overview

- Instrument Ground School Lecture
  - Definitions
  - Instrument Ratings
  - Preflight Considerations
  - Takeoff and Departure
  - En Route Procedures
  - Arrival and Approach Procedures
  - Lost Communications
  - Airspace Review
  - Weather

Takeoff and Departure

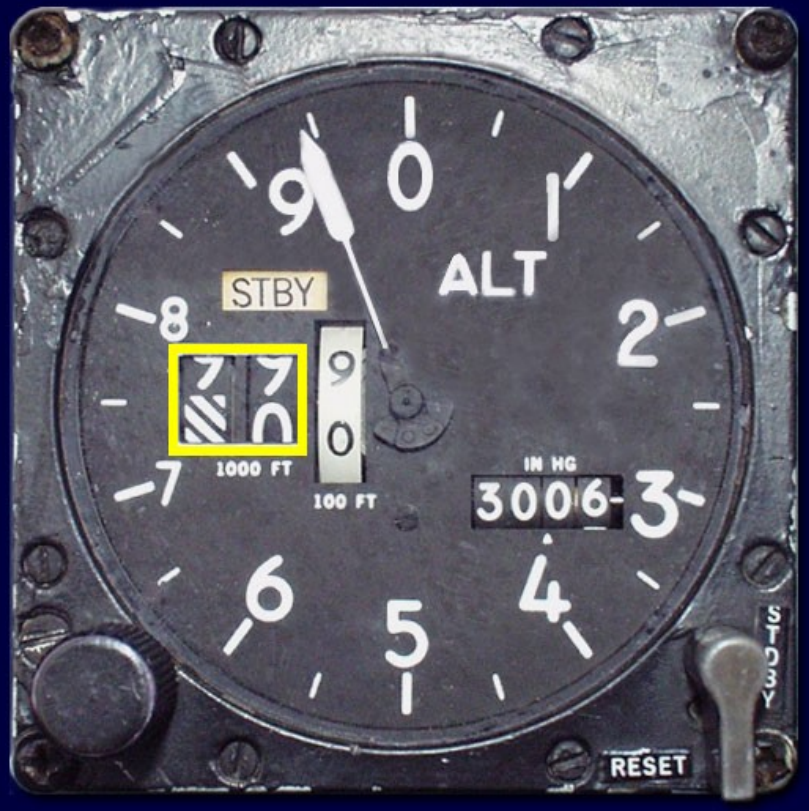
- Clearance items
- Altimeter checks
- Takeoff Weather Mins
- Standard Instrument Departures
- Oxygen Requirements
- Transition altitude

Clearance

- Clearance Items:
  - Aircraft identification
  - Clearance limit
  - Departure or SID
  - Route of flight
  - Altitude(s)
  - Holding instructions
  - Special instructions
  - Frequency and squawk
- Read Back if…
  - Requested
  - Confused
  - Different than filed

Altimeter Checks

- FAA rule
  - Barometric altimeter must read within 75 feet of ground elevation



Takeoff Weather Minimums

- Standard rating
  - Non-precision
    - Published minimums but not less than 300-1
  - Precision
    - Published Minimums not less than 200-1/2 (2400 RVR)
- Special rating
  - No minimums - pilot’s judgment
- Formation Takeoff
  - 1000-3 or Published Circling Minimums

Standard Instrument Departures

- Encouraged, but not required
- Vector off SID cancels the SID entirely, unless instructed otherwise
- Climb Via-abbv. ATC clnc that req. compliance w/ procedure lateral path, spd, alt restrictions.
- Climb via instructions added 3APR14. “climb via chambers 8 departure, montibello transition” = follow SID up to top altitude if published.
- Climb via SID except “maintain” a particular altitude is used if no top altitude is published or ATC wants to amend it.

When cleared on a SID but NOT given a “climb via” clearance, compliance with published altitude restrictions is not required, the pilot will climb to the ATC assigned maintain altitude and comply with published speed restrictions.

Pilots are required to advise ATC on initial contact that they are climbing via/descending via a procedure, and must include any additional

Transition Level Altimeter Setting

- Altitude at which you switch from local altimeter setting to 29.92
- FAA: 18,000 MSL
- Differ by country
- FL180 unusable when local altimeter is below 29.92

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Enroute Procedures

- IFR
  - Altitudes
  - Semi-circular rules
  - RVSM
- VFR
  - Altitudes
  - Semi-Circular rules
  - Considerations
- Voice Reports
- Airspace
- Services

IFR Altitudes

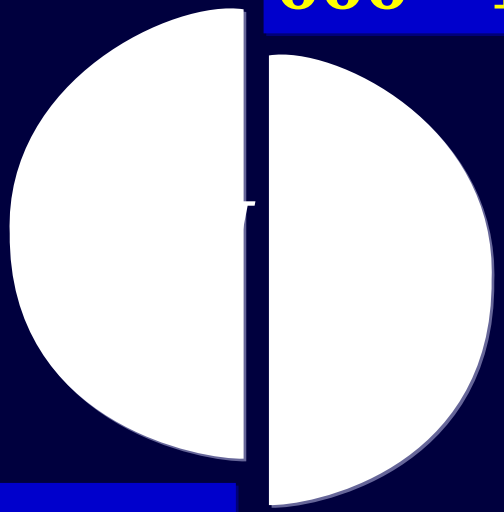
- MEA, MAA and MOCA’s
  - Guarantee obstruction clearance and Navaid reception.
  - MOCA assures reception within 22 miles of a VOR
- MSA and ESA
  - Ensure obstacle clearance of 1000 feet (2000 feet in mountainous areas)
- MVA
  - Ensures obstacle clearance factoring in radar coverage and radio reception

Semicircle Rules IFR

SFC to FL600

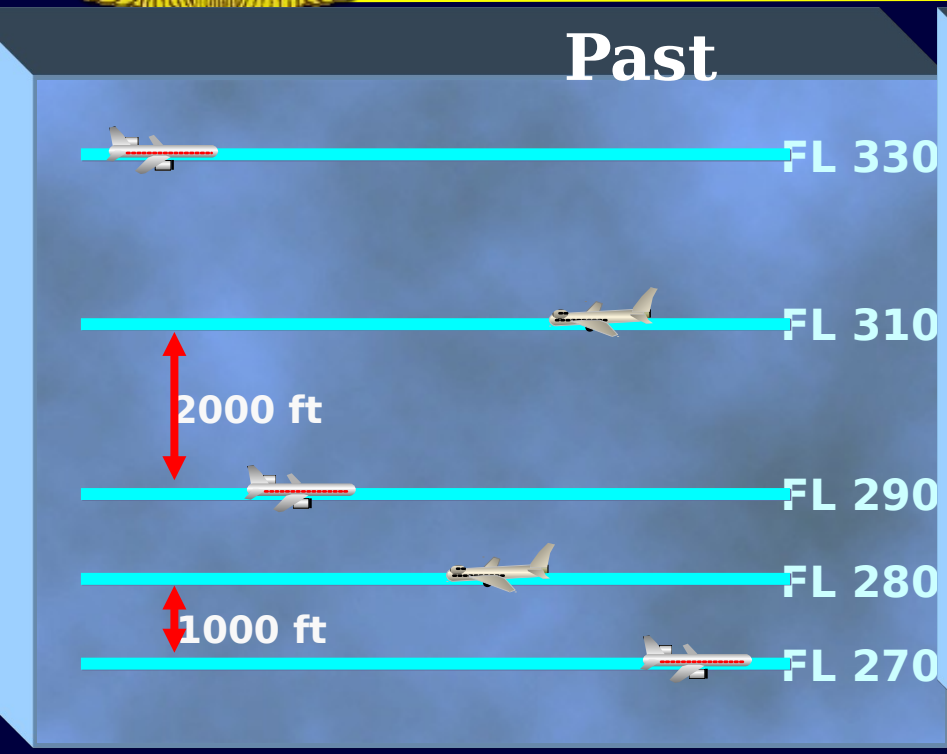
000 – 179

1000 FT INTERVALS



359 - 180

RVSM



- Reduced Vertical Separation Minimums (DRVSM = Domestic)
  - Vertical separation between FL 290-410 reduced to 1,000 ft
- More Aircraft in the same space
- Aircraft requires special equipment (E2/C2 non-compliant)

Exceptions to RVSM Equipment Requiremnts

- Accommodation of non-RVSM compliant aircraft operations in RVSM airspace will be limited to:
  - Department of Defense:
    - FAA **may** accommodate non-compliant military aircraft operation within RVSM airspace, without mission degradation, to the extent practicable based upon existing traffic and safety considerations
  - Lifeguard
  - Aircraft Certification and Development
  - Foreign State Aircraft

Access to RVSM Airspace for Non-RVSM Aircraft

- Submit an LOA with RVSM airspace governing ATC
- Annotate on flight plan request for RVSM airspace access
- DoD Priority Mission Notification (https://www.fly.faa.gov/rvsm)
  - Active continental/homeland defense
  - Immediate effect upon combat operations
  - MEDEVAC, SAR, emergency response
  - Transport of VIPs (4-star equivalent or above)

Consult the AP/1, Chapter 3 for more information

RVSM Denial Report

- If denied access to DRVSM, submit a DRVSM denial report

https://www.notams.jcs.mil/drvsm.html

DRVSM Denial Report

The following information will be utilized for Data Analysis.

Mission Information			
Callsign:		Date:	
Unit:		ATD (UTC):	
Number/Type Aircraft:		Departure ARTCC:	
Requested Altitude:		Destination:	
Clearance Altitude:			

Select as Applicable									
☐	File and Fly	☐	Designated Priority Flt	☐	ALTRV			☐	2 or Less ARTCCs
☐	US Army	☐	USN/USMC	☐	USAF	☐	NASA	☐	3 or More ARTCCs

Operational Information							
Operational/Training Objectives Accomplished?	☐	Yes	☐	Degraded	☐	No	
Must Re-Fly to Meet Mission Objectives?			☐	Yes	☐	No	
Profile Covered in Letter of Agreement?			☐	Yes	☐	No	
Mission Impact:							
Narrative:							

P O C:		Phone #:	
Email:		Fax #:	

Commercial and Civil Aircraft Avoidance

- 500 feet vertically
- 1 mile laterally
- No aerobatic maneuvers in close vicinity

Basic VFR

- 1000-3

(1000' Ceiling,
3SM Visibility)

Basic VFR Weather Mins

- Below 10,000’ MSL
  - 3 SM Vis
  - Clouds Separation
    - 500’ below
    - 1,000’ above
    - 2,000’ horizontal
- Above 10,000’ MSL
  - 5 SM Vis
  - Clouds Separation
    - 1,000 below & above
    - 1 SM horizontal

Special VFR

- ATC Clearance Required
- 500' Ceiling
- 1 SM Vis
- Pilot and aircraft must be IFR capable

VFR Considerations

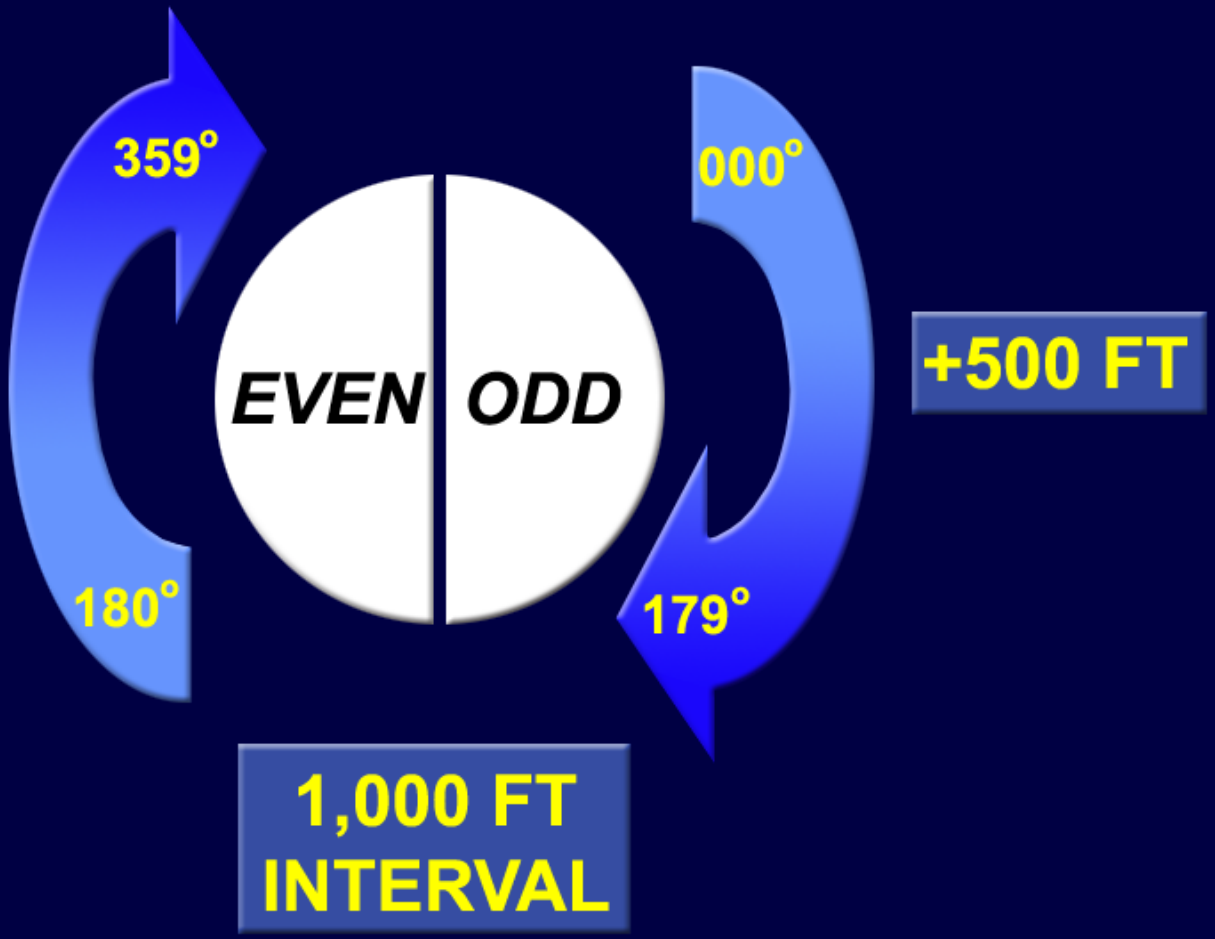
- 3000’ AGL above Noise Sensitive Areas, Wildlife Refuges etc.
- 500’ above ground or water (3710)
- 1000’ AGL above highest building or obstacle in urban areas (3710)

Fuel Dumping

- Minimum altitude for dumping fuel is 6,000 ft

  above the terrain
- Any altitude in an emergency situation

Semicircle Rules VFR
3,000’ up to 17,500’ MSL



VFR below 3,000’ AGL

- Aircraft could be operating at any altitude in any direction below 3,000ft AGL
- Keep clear of obstacles and maintain 3710 altitude requirements

Mandatory Voice Reports

- Under Radar Control:
  - Vacating assigned flight level or altitude for a newly assigned flight level or altitude
  - Altitude changes operating VFR on top
  - Vacating assigned altitude for approach
  - Missed approach
  - Speed changes of ±5% of TAS or ±10 KTS whichever is greater

Mandatory Voice Reports

Continued

- Non Radar:
  - Time and altitude or flight level when reaching a holding fix or point to which declared
  - Leaving assigned holding fix or point
  - PTAPTP at compulsory reporting points and each fix that defines a “direct leg”
  - Corrected estimated time when previously in error by three minutes

Special Use Airspace

- Prohibited areas (White House, Camp David)
  -Prohibited from flying through at all times
- Restricted areas (Military training, test ranges)
  -Coordination with controlling agency to fly through
- Warning areas - Restricted areas over water, 12NM from coast
- M.O.A. - segregates military activity from civilian, no VFR restrictions, ATC may vector you around while IFR
- Alert areas - High density traffic areas, pilot training, no flight restrictions → info only
- Controlled Firing Area - Ground observers responsible for cease fire when aircraft spotted, no flight restrictions

En Route Weather and Services

- PMSV - Pilot to “Metro” Service
- HIWAS - Hazardous In-flight Weather Advisory Service
- AWOS/ASOS - Automated Weather/Surface Observation System
- ATIS - Automatic Terminal Information System

Flight Service Stations (FSS)

- Close flight plans
- In-flight filing
- Weather observations
- Phone calls
- Many provide online description of services

Flight Service Stations

- Monitor VHF/UHF:

255.4

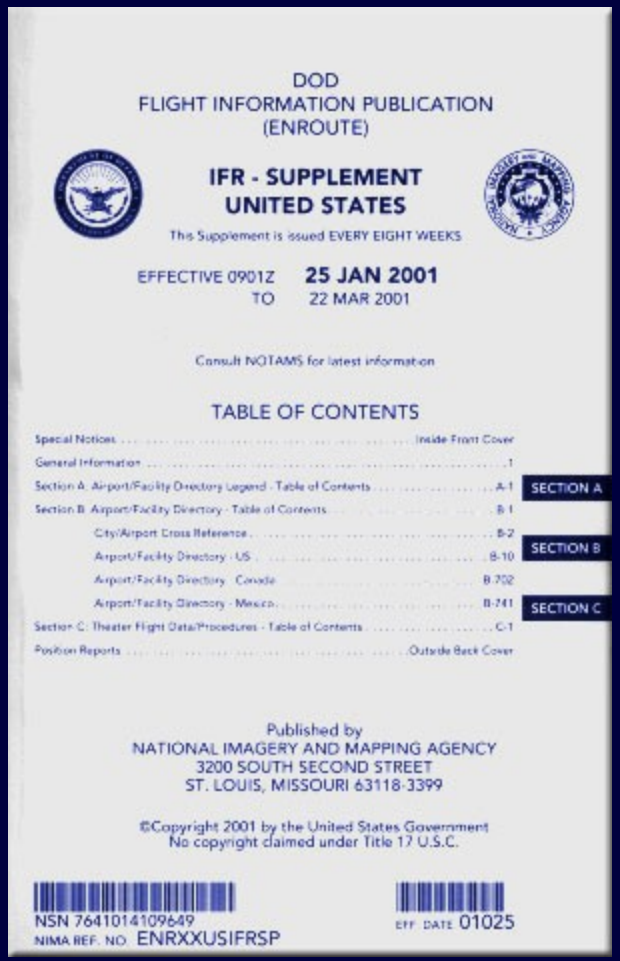
122.2

243.0

121.5

122.0

- En Route Supplement and en route Charts will give additional information and frequencies



DOD
FLIGHT INFORMATION PUBLICATION
(ENROUTE)

IFR - SUPPLEMENT UNITED STATES

This Supplement is issued EVERY EIGHT WEEKS

EFFECTIVE 0901Z **25 JAN 2001**
TO 22 MAR 2001

Consult NOTAMS for latest information

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NIMA REF. NO. ENRXXUSIFRSP
EFF. DATE 01025

Course Overview

- Instrument Ground School Lecture
  - Definitions
  - Instrument Ratings
  - Preflight Considerations
  - Takeoff and Departure
  - En Route Procedures
  - Arrival and Approach Procedures
  - Lost Communications
  - Airspace Review
  - Weather

Arrival and Approach Phase

- STARS
- Transition levels
- Holding
- Approach plates
- Types of approaches
- Single-piloted approach
- Multi-piloted approach
- Practice approaches
- Missed Approach
- Approach Lighting

STAR’s

- All pilots can refuse STARs
  - Note on flight plan “No STARs”
  - DESCEND VIA – An abbreviated ATC clearance that requires compliance with a published procedure lateral path and associated speed restrictions and provides a pilot-discretion descent to comply with published altitude restrictions.
  - A “descend via” clearance must not be used where procedures contain only published “expect” altitude
  - If the intent is to comply with altitude restrictions while changing the top/bottom altitude use ‘climb/descend via except'. If compliance with the altitude restrictions is not required when rejoining a procedure use “resume” and "maintain“ to rejoin the procedure and assign a new altitude to the aircraft.

Maximum Holding Airspeed

- All Aircraft May hold at the following speeds:
  - 0 - 6,000 FT 200 knots,
  - 6,001 - 14,000 FT 230 knots
  - >14,000 FT 265 knots
- Leg Lengths:
  - 0 - 14,000 FT 1 Minute
  - >14,000 FT 1 ½ Minutes

****Slow to max holding speed 3 minutes prior to**

Maximum Holding Airspeed

- Exceptions:
  - Holding pattern may be restricted to 175 KIAS
  - 6001 - 14000FT may be restricted to 210 KIAS
  - Both conditions will be depicted

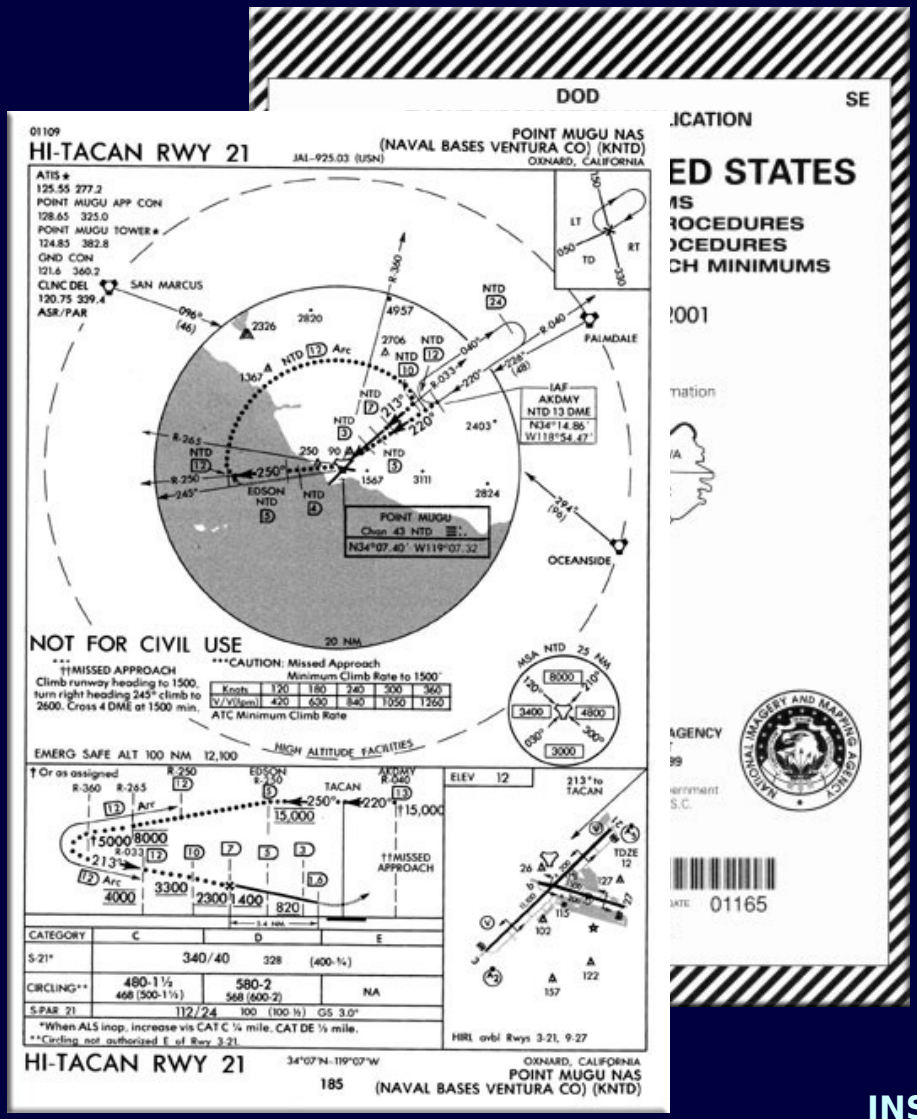
  - Aircraft at Navy Fields:
    - All Altitudes 230 knots
  - Aircraft at Air Force Fields:
    - All Altitudes 310 knots

Holding Instructions

- Published Holding
  - Expected further clearance
  - Amendments or Special Instructions
- Non-Published Holding
  - Holding fix
  - Direction to holding fix
  - Leg length
  - Turn direction
  - Altitude
  - EFC

Approach Plates

- All altitudes are MSL except:
  - HAT, HAA, TCH, and ceilings
- MDA, DH
- VDP
- MSA 25 NM
- ESA 100 NM



Approaches

- Visual
  - IFR clearance to proceed VMC to field
  - Reported weather must be at least 1000-3
  - “No traffic in sight”
    - ATC retains separation and wake avoidance responsibility
  - “Traffic in sight”
    - Pilot maintains separation and wake avoidance

Approaches

- Precision
  - Azimuth and reliable glideslope information
  - PAR, ILS and GPS*
- Non-precision
  - Azimuth only
  - TACAN, ASR, VOR, NDB and GPS
- Ground Controlled (GCA)
  - PAR and ASR

Approaches

- Straight-in
  - Final course within 30 degrees centerline
- Circling
  - 300 feet of obstacle protection
- Sidestep
  - 1,200 foot maximum runway separation
  - Expected to commence ASAP once cleared and runway in sight

Non-DoD Approaches

- OCONUS Jeppesen Approaches
  - Require annual validation
    - (OPNAV FORM 3722-6)
  - OPNAV 3710 CH-3.13.1.1
    - "Commanders (0-8 or above) exercising OPCON of aircraft operating in support of [humanitarian, contingency, MEDEVAC, special access or state department requirements] are responsible for mission risk assessment and, therefore, may waive the requirement for a TERPS review of a non-USG instrument procedure"

GPS

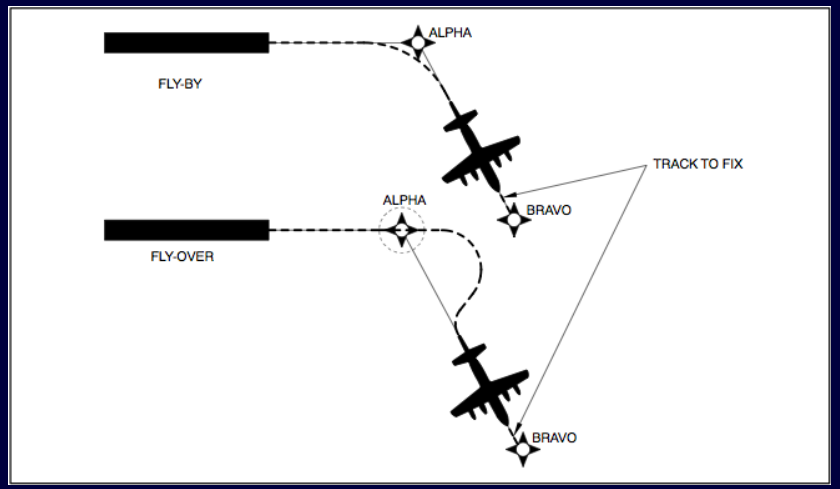
A properly integrated GPS system with an integrity function may be used for primary and supplemental navigation during en route, terminal, and GPS NPA phases of flight when certified.

E-2C and C-2A are certified for all phases of GPS routing excluding precision approaches.

E-2D is not certified for any phase of flight and must file E2/P.

GPS Approaches

- GPS Waypoints
  - Fly-by
    (intersection)
  - Fly-over
    (halo around pt)



- Approach Specific Waypoints
  - -Computer Navigation Fix
    - Used to by GPS system to define the Nav track
    - Not to be used for ATC application or filing
    - Characterized by parentheses around point → (YATTO)
  - -Unnamed
    - Uniquely identified for each airport

RAIM Computation

- Receiver Autonomous Integrity Monitoring (RAIM)
  - Integrity computation for present position or at a specified waypoint
    - 5 Satellite Reception
  - Horizontal Integrity Limit (HIL) Is Determined
    - Differs with each phase of flight
      - Oceanic (en route)
      - Terminal
      - Approach

GPS Alternate Restrictions

- Alternate Navigation Equipment
  - If alternate required, aircraft must have operational equipment to navigate any non-GPS route or approach for the alternate.

GPS Approach Restrictions

- RAIM must be available at Final Approach Fix
- Pilots responsible for all altitude restrictions
- RNAV in the Terminal Area:
  - When using GPS as primary Nav Source
    - All waypoints must be retrieved from database
    - User-defined waypoints cannot be used after the IAF or before SID completion
    - Required Navigation Performance (RNP) of .3 required at FAF, otherwise go missed approach

Single Piloted Approach

- Shall not commence approach with weather below minimums at destination
- Approach commences when below highest penetration altitude for HA approaches
- Absolute minimums 200-1/2 (2400 RVR)

Multi-Piloted Approach

- May commence approach with weather below minimums
- Must have fuel capability to shoot the approach and get to your alternate

Practice Approaches

- No intention of landing
- WX may be below minimums
  - Must not be a filed destination or alternate
  - WX at destination and alternate must meet filing criteria
- Not affected by single or multi-piloted

Missed Approach

- May initiate early
- Climb immediately
- Maneuver to MAP before making turns specified in the MA instructions

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Lost Communications

- VMC
- IMC
- Holding
- Approach
- Aldis Signals

Lost Communications

- If VMC:
  - Squawk 7600
  - Maintain VMC
  - Continue VFR
  - Land as soon as practicable
    - Don’t continue a three hour cross country!

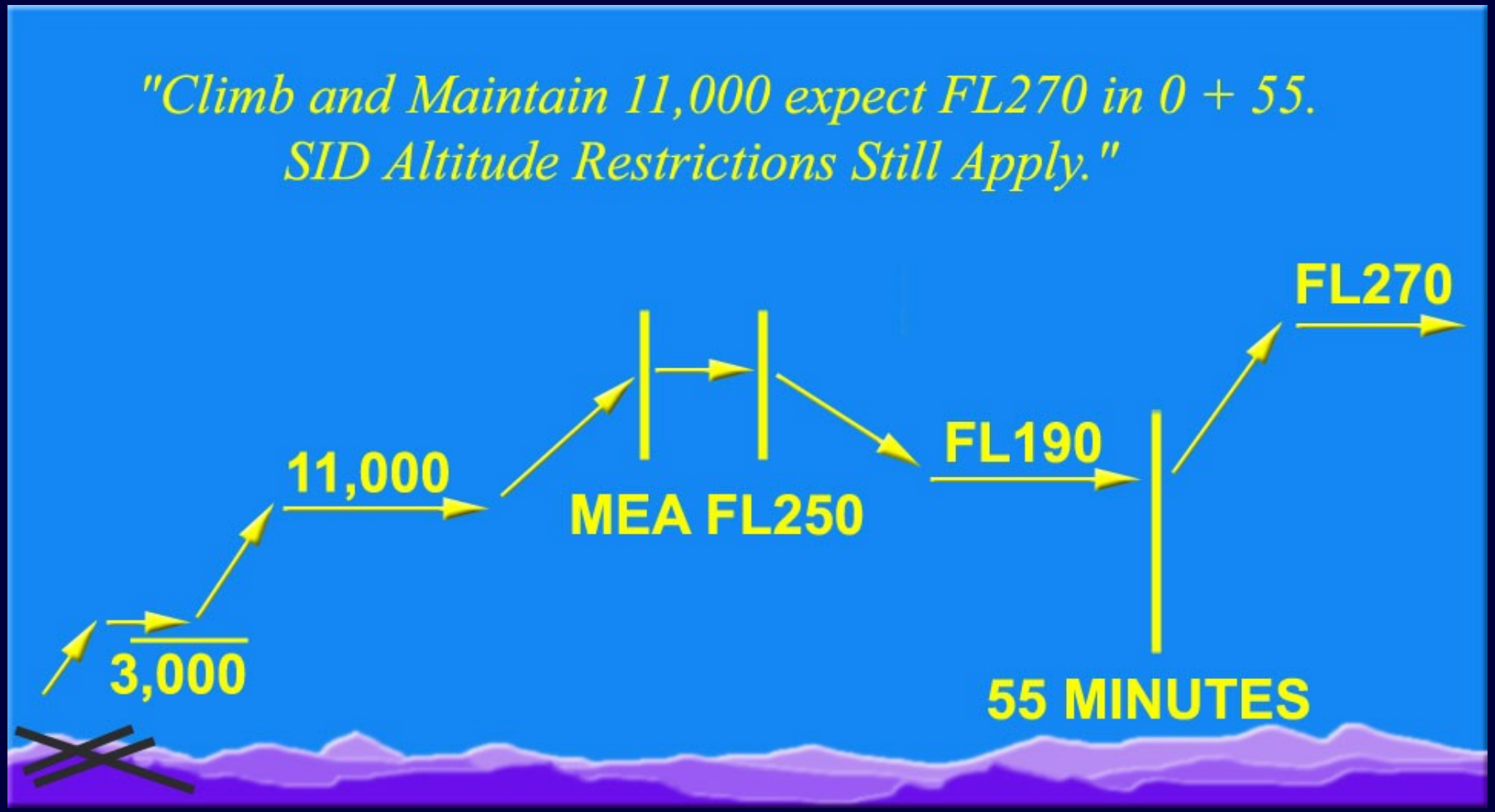
Lost Communications

- If IMC:
  - Squawk 7600
  - Route (Precedence)
    - Last **A**ssigned
    - Radar **V**ector - direct from NORDO point to FIX, route, or airway specified
    - **E**FC route
    - As **F**iled

Lost Communications

- Highest altitude of:
  - Last **A**ssigned
  - **M**EA
  - **E**FC altitude
- Altitudes are for particular route segment being flown, not for entire route

Lost Communications



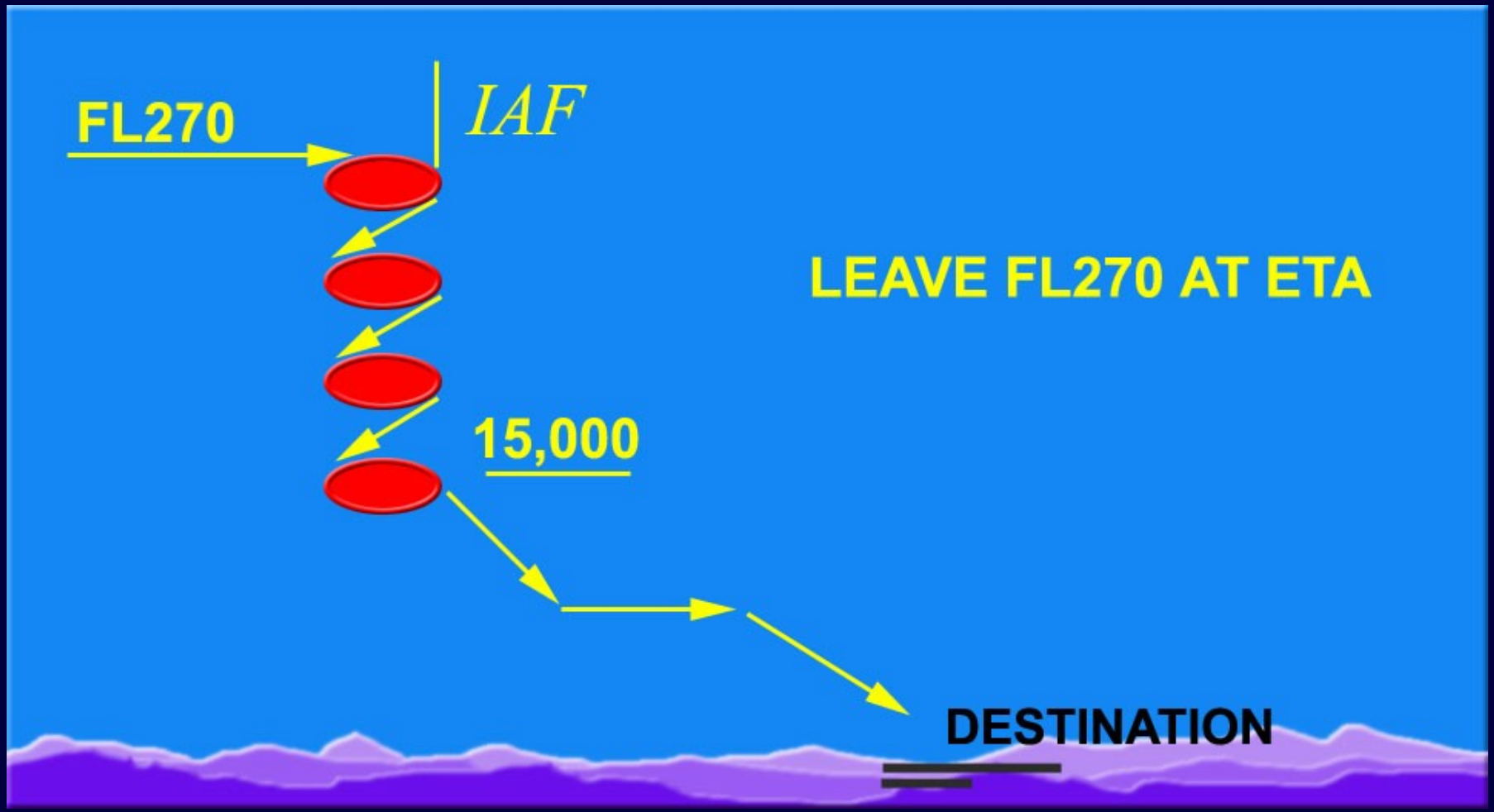
Lost Communications

- En-Route Delay:
  - If cleared for delay - must execute it
  - If no clearance received for delay, continue to destination as if no delay, commence at normal ETA

Lost Communications

- Lost Comm. Approach:
  - Hold at IAF as published
    - Holding not depicted, use procedure turn side
- Commence at:
  - EFC/ETA or immediately if late
- Descent
  - at EFC or ETA
  - In holding to initial approach altitude

Lost Communications



Lost Communications

- Radar Approaches:
  - 1 minute in pattern
  - 15 second ASR final
  - 5 second PAR final
  - Proceed with published approach or instructions
  - Altitude:
    - Until on published approach highest of:
      - Last assigned
      - Minimum safe
      - Emergency safe (if outside of 25 nm)

Aldis Lamp Signals

- Steady green –
  - clear to takeoff or land
- Flashing green –
  - Ground - clear to taxi
  - Airborne - return for landing
- Steady red –
  - Ground - stop
  - Airborne - give way to other aircraft and circle
- Flashing red –
  - Ground - taxi clear of the runway in use
  - Airborne - airfield unsafe, do not land

Flashing white –

Ground - taxi back starting point

Alternating red and green

General warning use extreme caution

Red flare or pyrotechnic –

Do not land

Course Overview

- Instrument Ground School Lecture
  - Definitions
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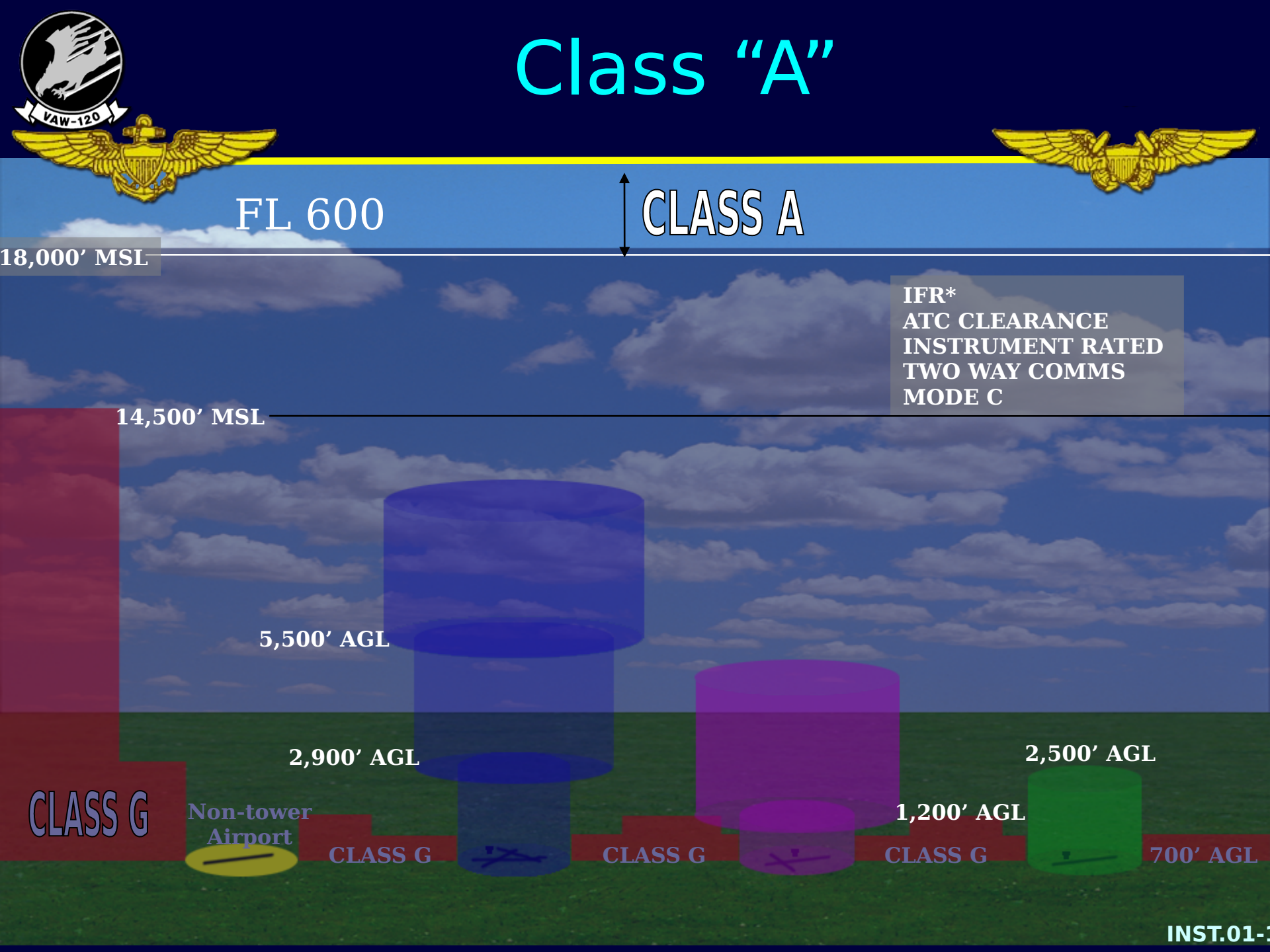
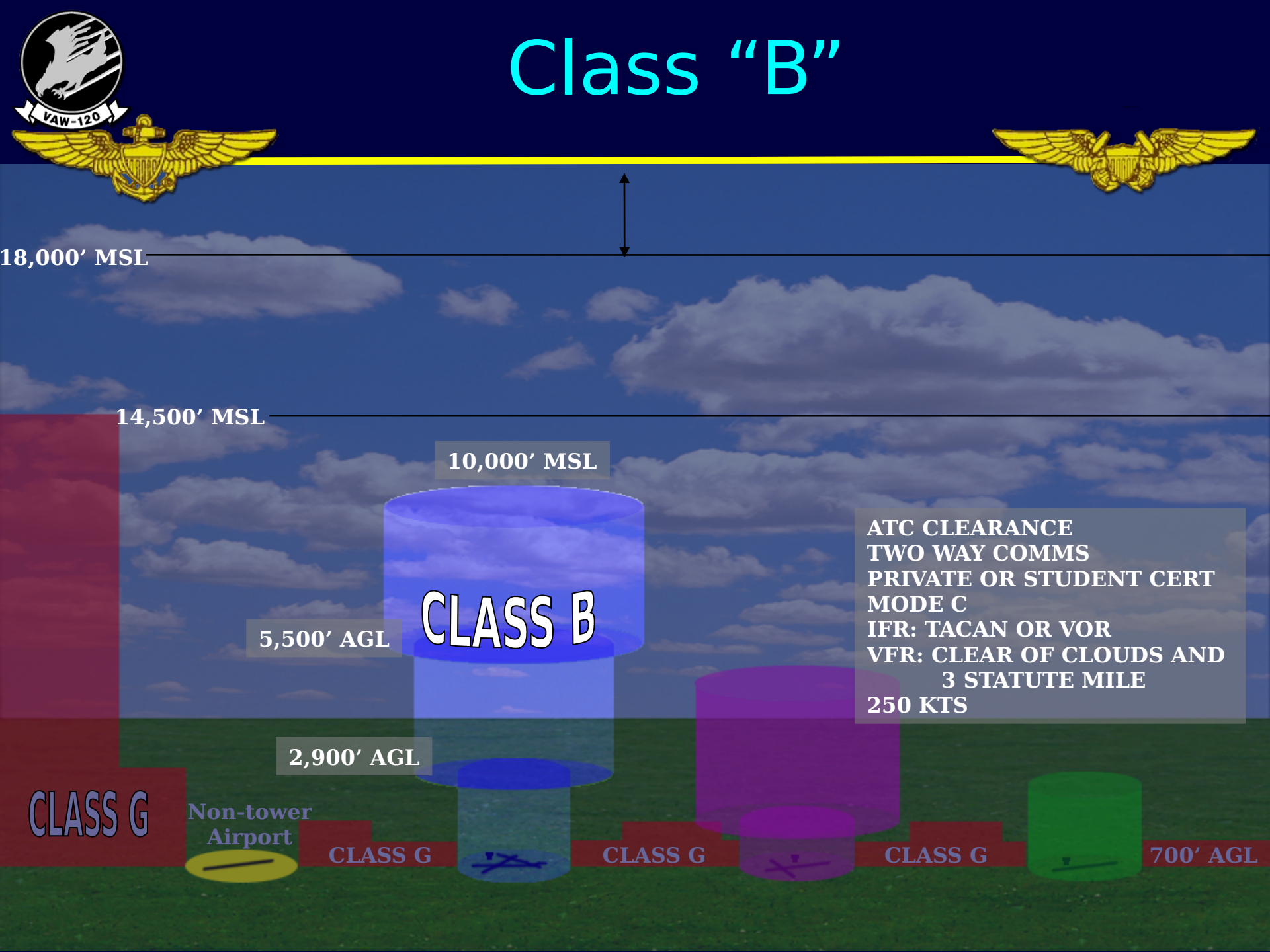
  - Preflight Considerations
  - Takeoff and Departure
  - En Route Procedures
  - Arrival and Approach Procedures
  - Lost Communications
  - Airspace Review

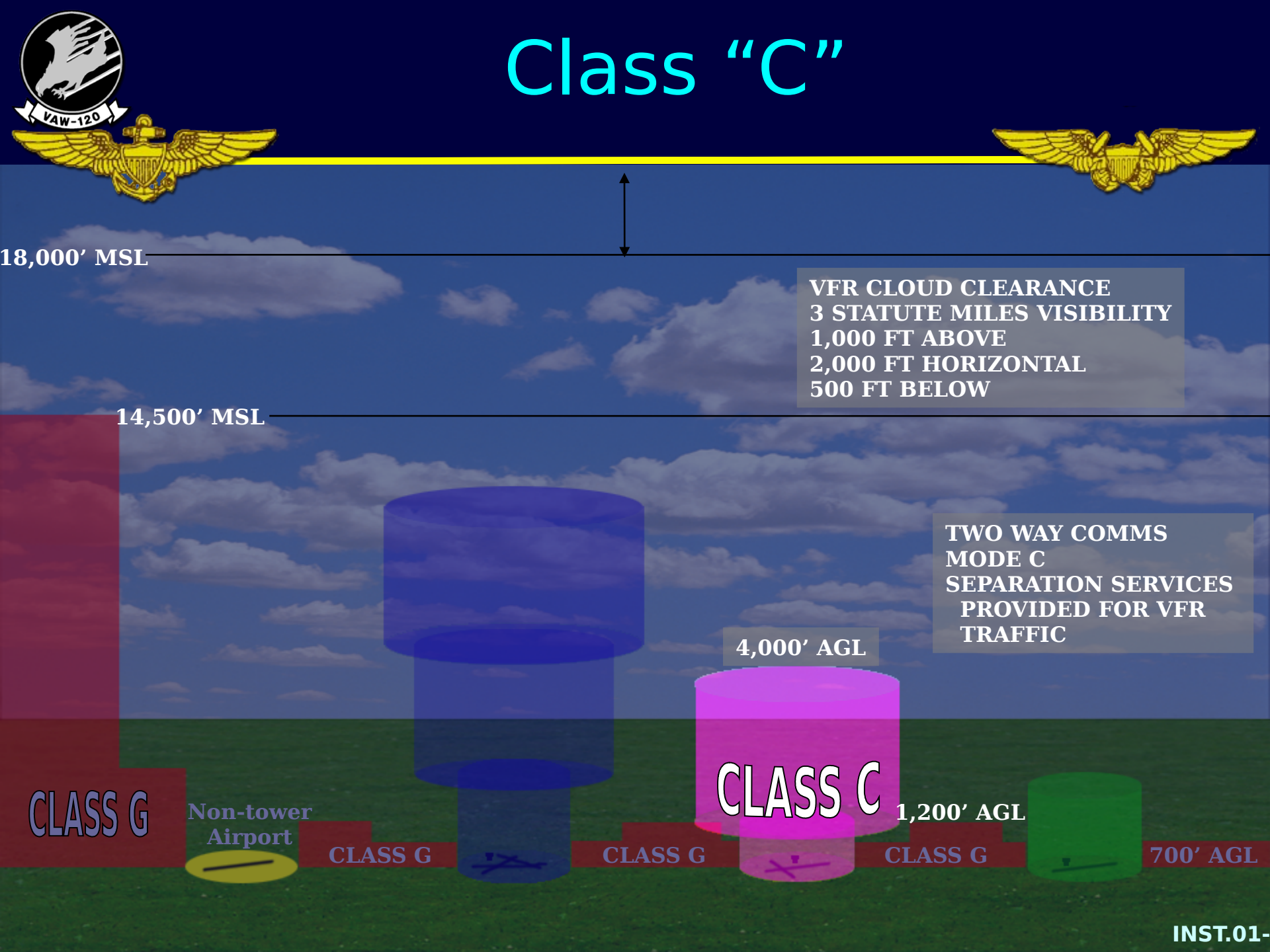
Class “A”


FL 600
CLASS A
18,000’ MSL
IFR*
ATC CLEARANCE
INSTRUMENT RATED
TWO WAY COMMS
MODE C
14,500’ MSL
5,500’ AGL
2,900’ AGL
2,500’ AGL
1,200’ AGL
CLASS G
Non-tower
Airport
CLASS G
CLASS G
CLASS G
700’ AGL

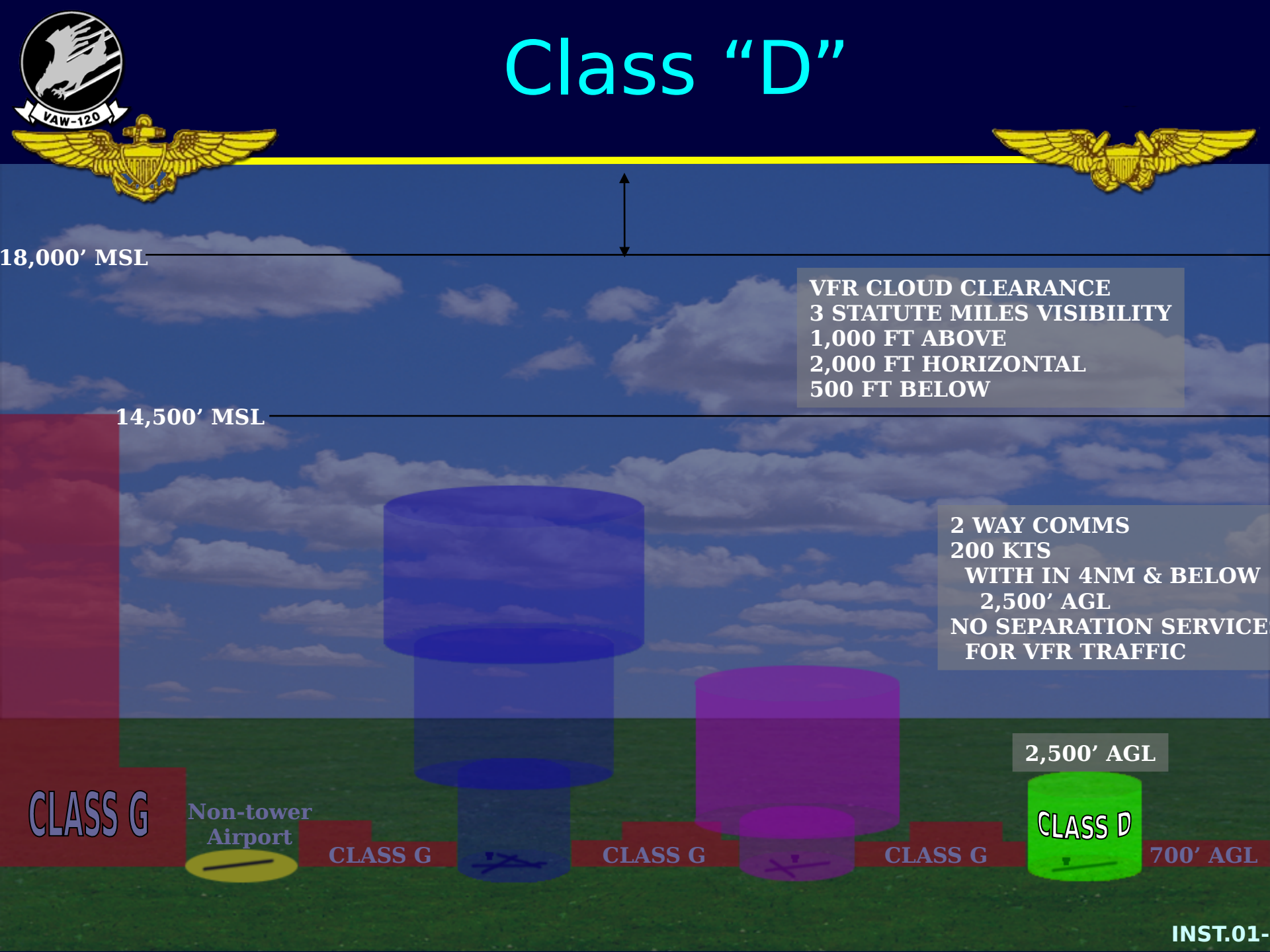
Class “B”


18,000’ MSL
14,500’ MSL
10,000’ MSL
CLASS B
5,500’ AGL
2,900’ AGL
ATC CLEARANCE
TWO WAY COMMS
PRIVATE OR STUDENT CERT
MODE C
IFR: TACAN OR VOR
VFR: CLEAR OF CLOUDS AND
3 STATUTE MILE
250 KTS
CLASS G
Non-tower
Airport
CLASS G
CLASS G
CLASS G
700’ AGL

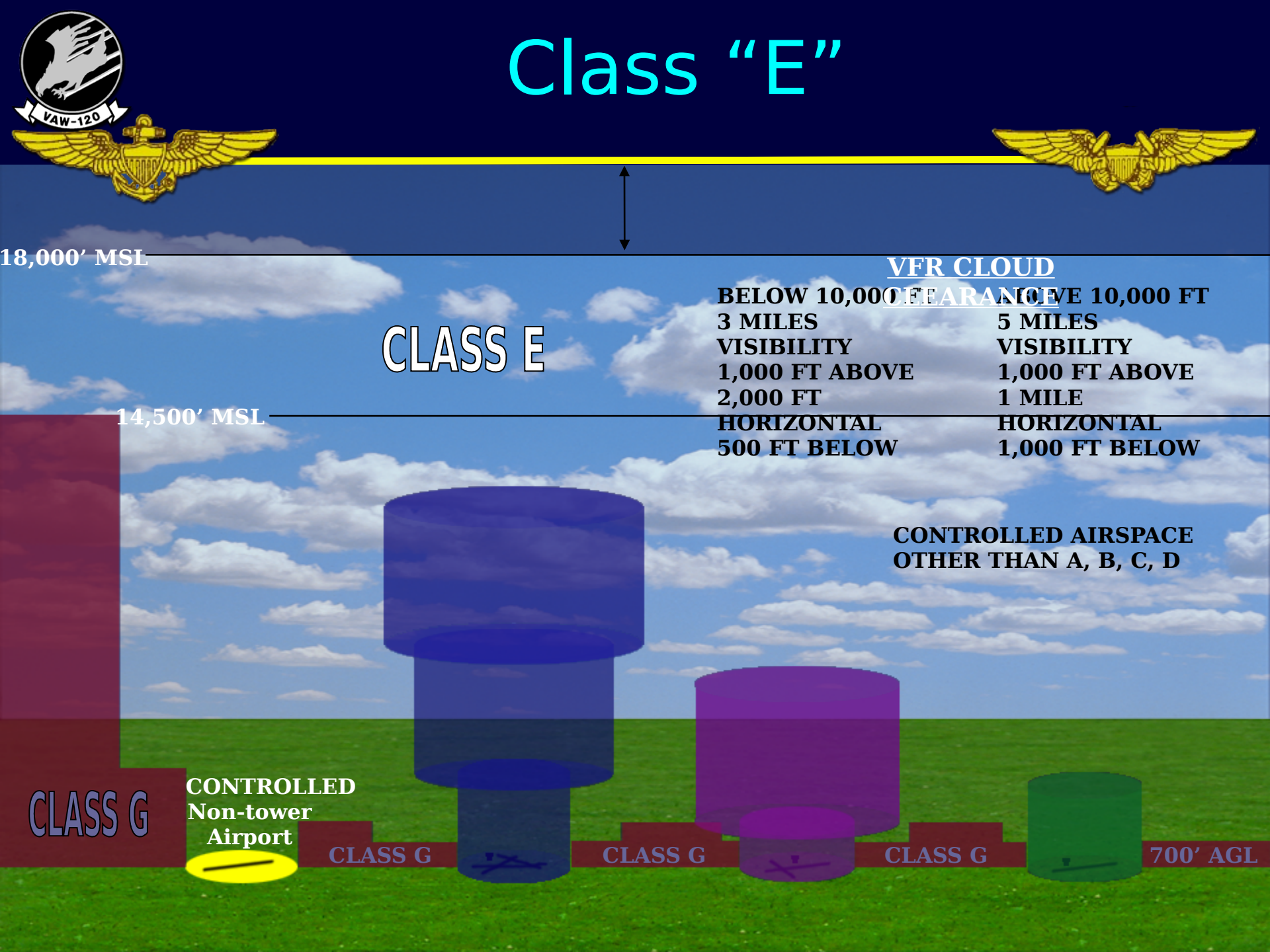
Class “C”


18,000’ MSL
VFR CLOUD CLEARANCE
3 STATUTE MILES VISIBILITY
1,000 FT ABOVE
2,000 FT HORIZONTAL
500 FT BELOW
14,500’ MSL
TWO WAY COMMS
MODE C
SEPARATION SERVICES
PROVIDED FOR VFR
TRAFFIC
4,000’ AGL
CLASS G
Non-tower
Airport
CLASS G
CLASS G
CLASS C
1,200’ AGL
CLASS G
700’ AGL

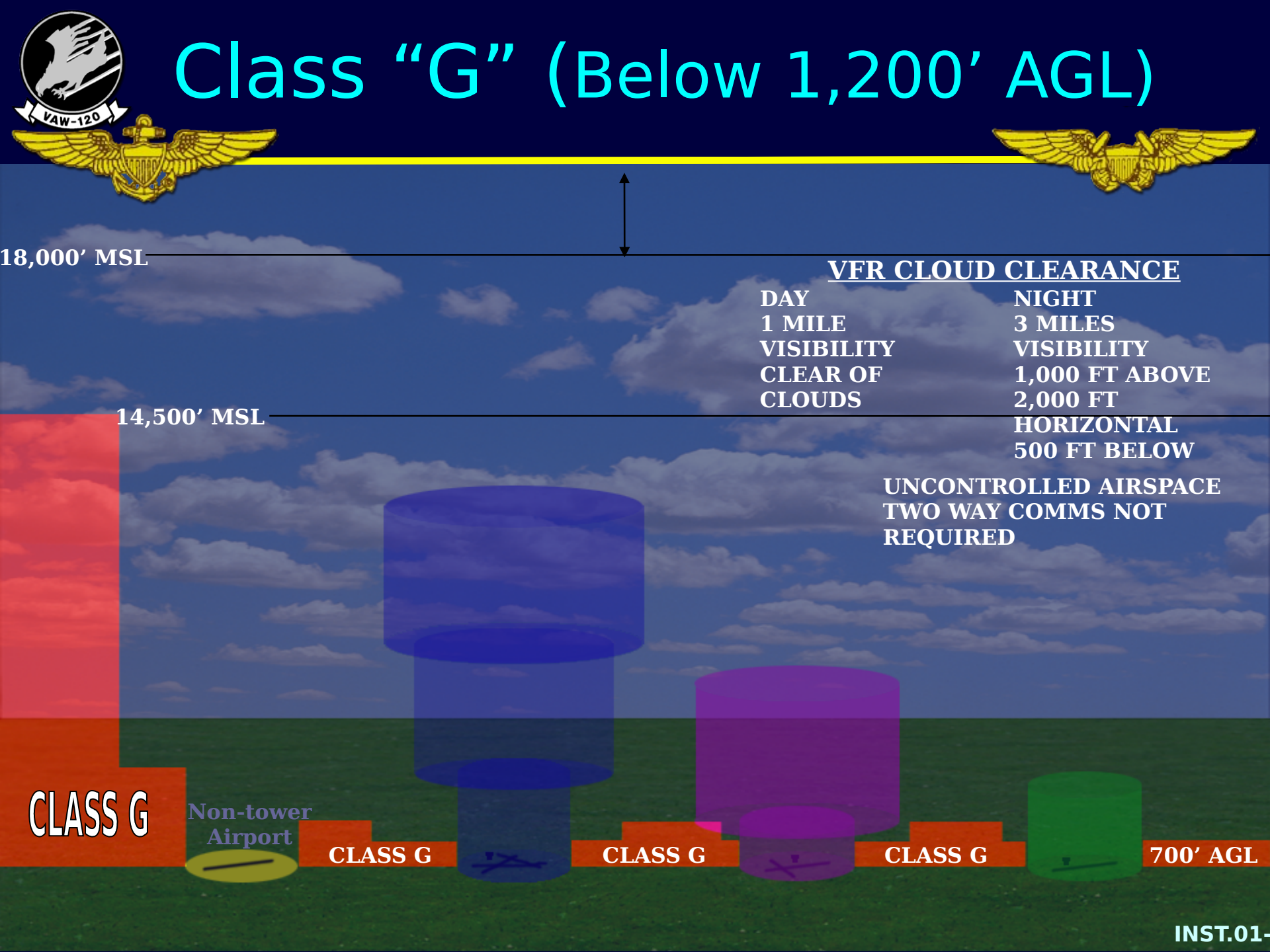
Class “D”


18,000’ MSL
VFR CLOUD CLEARANCE
3 STATUTE MILES VISIBILITY
1,000 FT ABOVE
2,000 FT HORIZONTAL
500 FT BELOW
14,500’ MSL
2 WAY COMMS
200 KTS
WITH IN 4NM & BELOW
2,500’ AGL
NO SEPARATION SERVICE
FOR VFR TRAFFIC
2,500’ AGL
CLASS G
Non-tower
Airport
CLASS G
CLASS G
CLASS G
CLASS D
700’ AGL

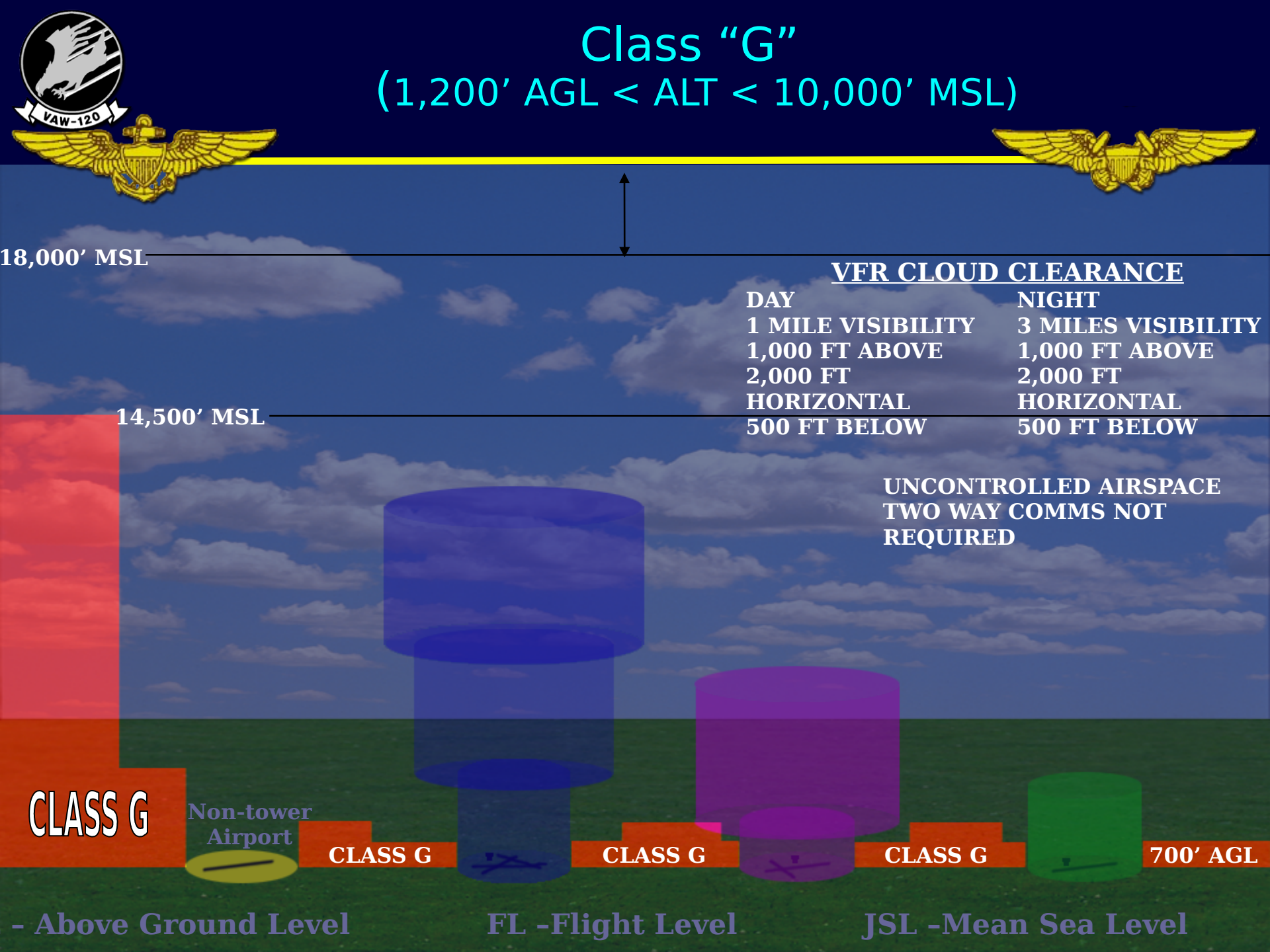
Class “E”


18,000’ MSL
CLASS E
14,500’ MSL
VFR CLOUD CLEARANCE
BELOW 10,000 FT
3 MILES
VISIBILITY
1,000 FT ABOVE
2,000 FT
HORIZONTAL
500 FT BELOW
ABOVE 10,000 FT
5 MILES
VISIBILITY
1,000 FT ABOVE
1 MILE
HORIZONTAL
1,000 FT BELOW
CONTROLLED AIRSPACE
OTHER THAN A, B, C, D
CLASS G
CONTROLLED
Non-tower
Airport
CLASS G
CLASS G
CLASS G
700’ AGL

Class “G” (Below 1,200’ AGL)



Class “G”
(1,200’ AGL < ALT < 10,000’ MSL)



Course Overview

- Instrument Ground School Lecture
  - Definitions
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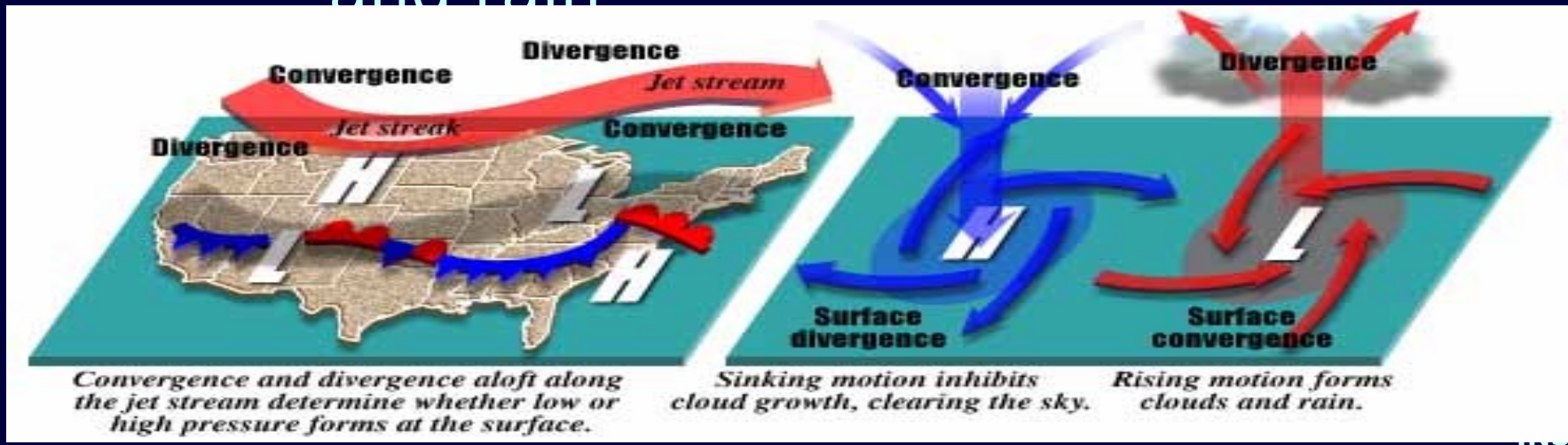
  - Lost Communications
  - Airspace Review
  - Weather

Weather

Low and High Pressure Systems

- High Pressure System
  - -Sinking motion of air inhibits cloud growth
- Low Pressure System
  - -Rising motion of air forms clouds and rain



Warm Front

A warm front is the boundary of air between warm and cool air when the warm air is replacing the cool or cold air.

Cold Front

A cold front is the boundary between warm and cool air when the **cool air is advancing** to replace the warm air. The air mass behind the cold front is not always frigid, especially during summer. More severe Wx generally associated with cold front passage.

Stationary Front

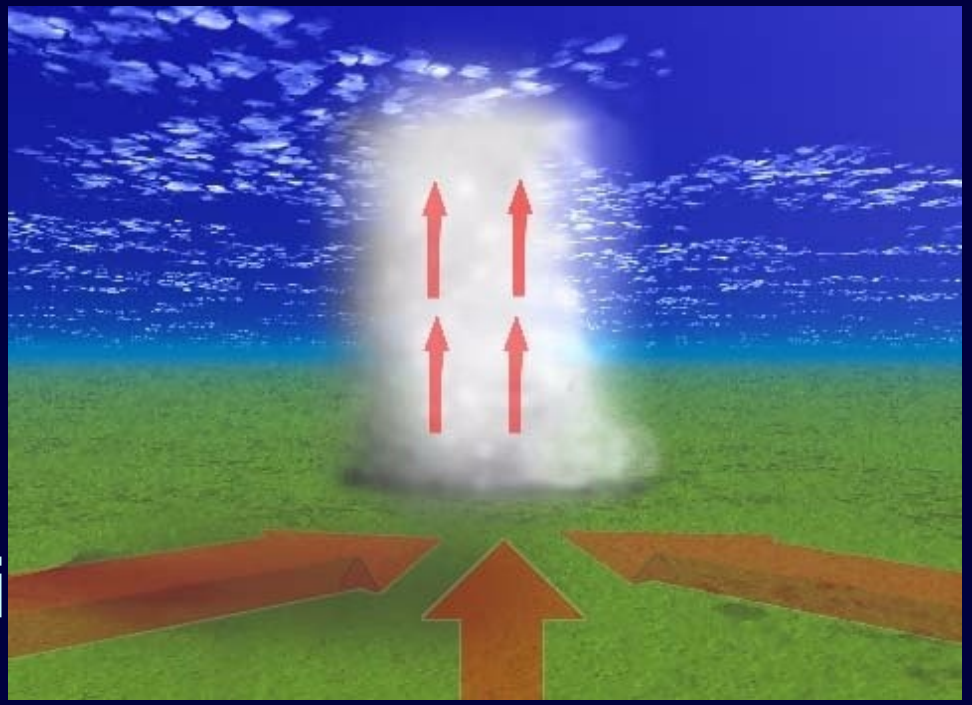
When the pushing becomes a stand-off between fronts, the boundary is called a stationary front. Stationary fronts often bring several days of cloudy and wet weather.

Thunderstorms

- Three Stages**: Cumulus, Mature, Dissipating**

- Cumulus Stage
  -All Updrafts
  (up to 2500fpm)

- Possible severe ici
  near tops

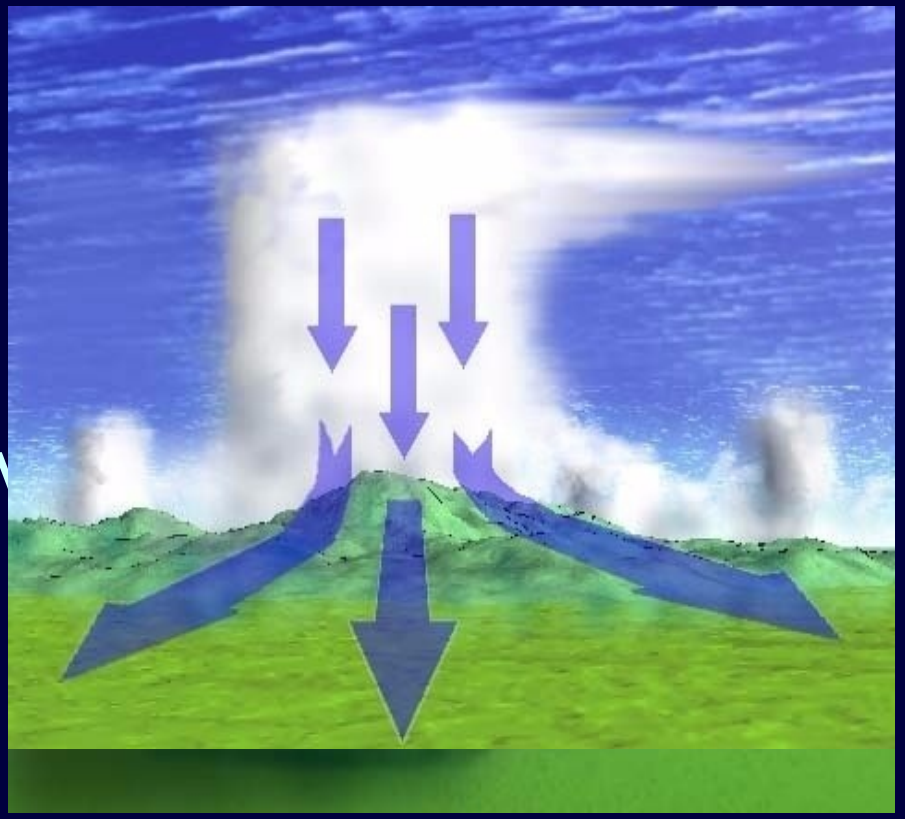


Thunderstorms

- Mature Stage
  -Up/Downdrafts
  (2500-6000fpm)
- Freezing Level
  most hazardous
- Stage where lightnin
  is generated

Thunderstorms

- Dissipating Stage
  - All Downdrafts
- Characterized by anv
  top rising
- Possible Microbursts



Thunderstorm Avoidance Route

1. Around
   - Circumnavigate by at least 5NM
2. Over
   - Possible tops of 60K
3. Under
   - Possible turbulence/hail
4. Through lower 1/3
   - Possible downburst/hail
5. Through upper 2/3
   - Hail/lightning/turbulence

Fog

- Classifications of Fog
  - Radiation Fog
  - Advection Fog
  - Steam Fog

- Typically forms when temp reaches within 3 degrees C (5 F) of the dew point

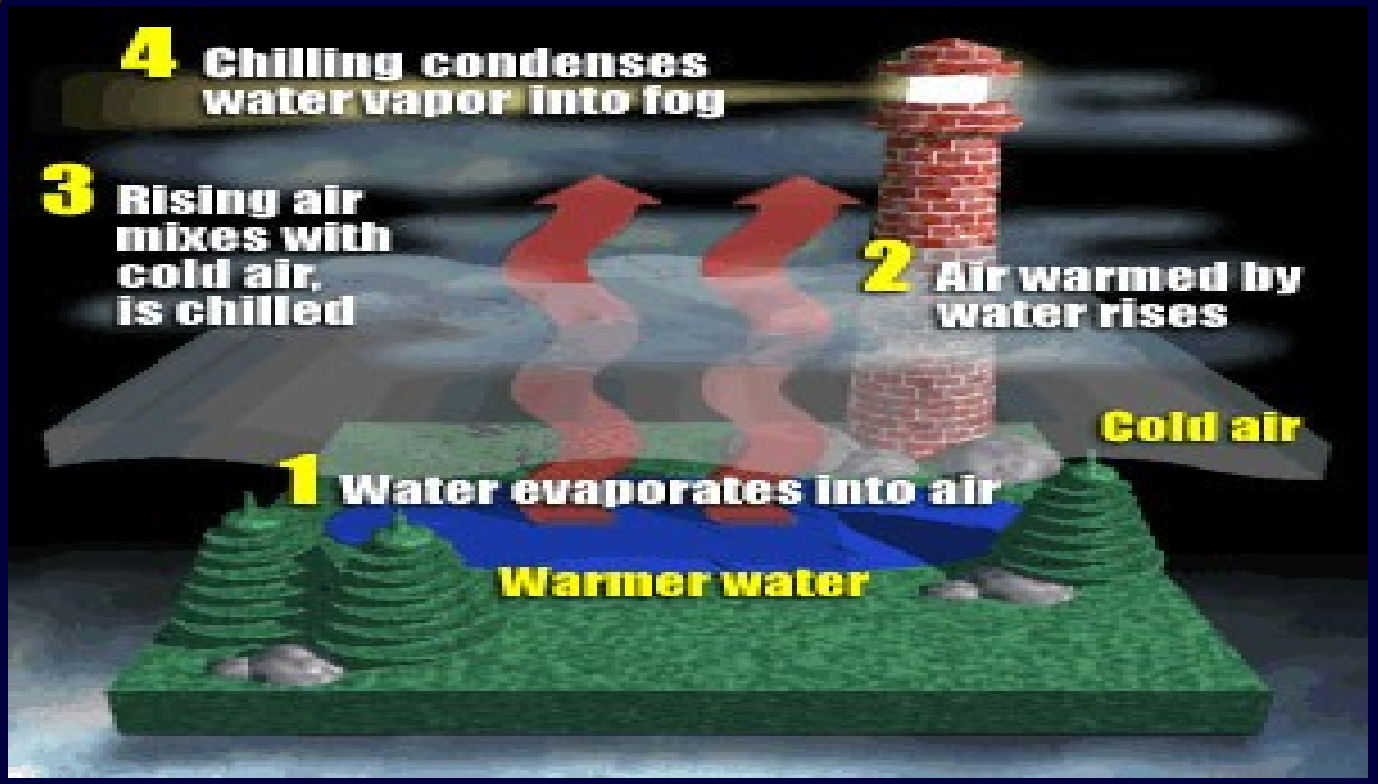
Radiation Fog

- Generally occurs as “Ground Fog” due to radiational cooling of ground
- Ground warms during the day, that heat is given off at night over cool air
- Disappears soon after sunrise
- 100-300 feet thick vertically

Advection Fog

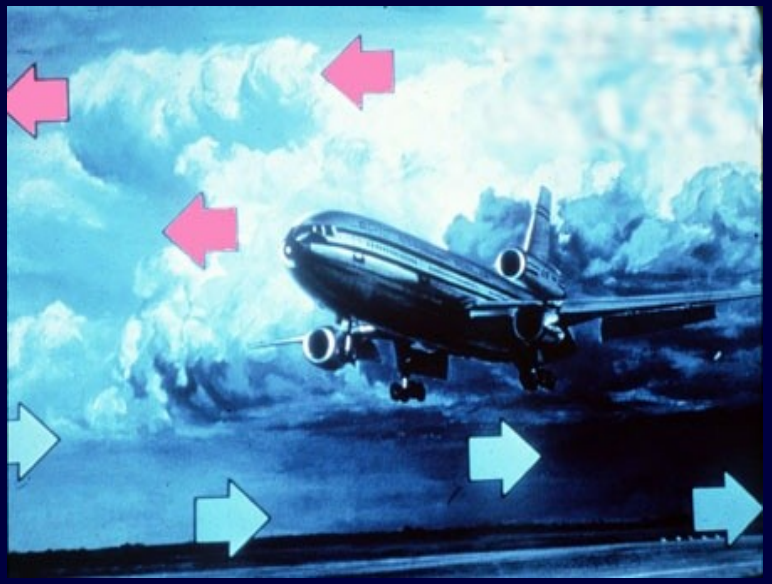
- Produced by air in motion as warm air travels over a colder surface
- Typically happens near large bodies of water

Steam Fog/Sea Smoke


4 Chilling condenses water vapor into fog
3 Rising air mixes with cold air, is chilled
2 Air warmed by water rises
Cold air
1 Water evaporates into air
Warmer water

- Cold dry air mass over warm water, warm water condenses and produces fog
- Forms a few inches to a few feet above the water

Wind Shear



- Change in wind speed, direction or both over a short distance
- Characterized by abnormally high power settings, significant difference between reported and actual wind, fluctuations in air/ground speed

Causes of Wind Shear Accidents

- Convective Conditions - 65%
- Frontal Systems – 15%
- Low altitude Jet Stream – 5%
- Strong/gusty surface winds – 5%
- Other causes – 10%
  - -Temperature inversions
  - -Mountain Wave
  - -Sea Breeze Circulation

Wind Shear Avoidance Practices

- Delay takeoff/approach until conditions improve
- Increase rotation speed
- Use longest runway (taking into account x-wind)
- Achieve a stabilized approach prior to FAF
- Be prepared to go around
- Co-pilot should closely monitor flight path

Dangers Signs of a Microburst

- Low level wind shear
- Severe turbulence
- PIREPS
- Blowing dust or rings of dust
- Temp/dewpoint spread of 17-28C (30-50F)
- Thunderstorms

Icing

- Common range 5C to -20C (OAT)
- At fronts, in thunderstorms or whenever in visible moisture in common temperature ranges
- Clear Ice: 5C to -10C

  -Smooth, hard to see, adds to gross weight, changes airflow over wing
- Rime Ice: -15C to -20C

  -Chunky, easier to see, more pronounced changes in airflow over wing
- Mixed: -10C to -20C

Lightning

- All thunderstorms produce lightning
- Originates from upper portion of cloud
- Can extend out 10-15 miles from cloud
- Can strike aircraft at any altitude

Hazardous Weather Reports

- SIGMET: Potentially hazardous weather
- AIRMET: Less severe weather
  (IFR, moderate turbulence/icing)
- Severe Weather Watch Bulletin (WW)
  -Expected development of severe weather
  -3710.7U restrictions
- PIREPS
- Navy Flight Weather Briefer

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  - Weather

Exams

- NFOs complete Qs 1-33 of the Closed Book
- Pilots with a current INSTX will complete the entire Closed Book
- Student/Replacement Pilots will also complete the Open Book Exam

QUESTIONS??